

Wielding power in multiparty negotiations: the impact of communication medium and assertiveness

Jonathan I. Lee

*Peter T. Paul College of Business and Economics, University of New Hampshire,
Durham, New Hampshire, USA*

Daisung Jang

Business School, University of Queensland, Brisbane, Queensland, Australia

Elizabeth A. Luckman

*Gies College of Business, University of Illinois at Urbana-Champaign, Champaign,
Illinois, USA, and*

William P. Bottom

Olin Business School, Washington University in St. Louis, St. Louis, Missouri, USA

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Abstract

Purpose – The medium negotiators choose for communication will influence both process and outcome. To understand how medium influences power expression, this paper aims to compare value claiming by asymmetrically powerful negotiators, using face-to-face and computer-mediated messaging across two studies. Following up on long-standing conjectures from prominent coalition researchers, the authors also directly tested the role of the apex negotiator's personality in coalition formation and value expropriation.

Design/methodology/approach – The authors conducted two laboratory experiments which manipulated communication medium (computer-mediated vs face-to-face) in three- and four-person bargaining. They also varied asymmetry of power so the apex negotiator either could not be left out of a winning coalition (Study 1) or could be (Study 2). The authors measured trait assertiveness along with multiple indicators of hard bargaining behavior.

Findings – Communicating using instant messages via a computer interface facilitated value claiming for powerful negotiators across both studies. Trait assertiveness correlated with hard bargaining behavior in both studies. An index of hard bargaining behavior mediated the effect of assertiveness on value expropriation but only in the context where the powerful negotiator held a genuine monopoly over coalitions.

Originality/value – The authors contribute to the literature on multiparty negotiations by demonstrating persistent media effects on power utilization and by finally confirming the conjectures of prominent coalition researchers regarding personality. Though personality traits generate consistent effects on behavior, their influence on negotiation outcomes depends on the power structure. Negotiation theory needs to incorporate structural and situational factors in modelling effects of enduring traits. Negotiation research should move beyond a rigid focus on dyads.

Keywords Personality, Communication medium, Multiparty negotiation

Paper type Research paper



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1. Introduction

Negotiators increasingly rely on digital media for communication. Between 2005 and 2017, work from home increased 159% (Reynolds, 2019). The COVID-19 pandemic accelerated reliance on these newer forms of communication particularly for knowledge workers (Brynjolfsson *et al.*, 2020). The trend will likely continue, so arranging terms of exchange, resolving disputes and establishing consensus about policy and strategic decisions will increasingly hinge on digital communication.

Media use may alter the costs of finding alternatives and exercising power in ways not equally afforded to all. Increasingly, global supply chains enable the more powerful to readily identify and contact alternative sources (Timmer *et al.*, 2014). By playing less powerful groups against each other, they claim more value from the chain of transactions (Phillips, 2017). We sought to examine the idea that digital communication may further enhance the ability of powerful negotiators to extract concessions, by better leveraging alternatives. We contribute to the understanding of the role of media use in the exercise of power.

Bargaining power varies with the strength of alternatives available to the parties. Alternatives provide the basis for rejecting offers for comparable or worse terms. They legitimate demands for additional value. Accordingly, prescriptive guidance urges negotiators to search for, analyze and enhance their outside options before engaging in the bargaining process (Fisher and Ury, 1981). Best Alternative to a Negotiated Agreement (BATNA) derives from other potential counterparts, who reflect varying degrees of potential for value claiming. In multiparty negotiations, negotiators secure alternatives by simultaneously managing multiple interactions and relationships. The medium for communication changes the cost and ease of switching between communication partners, likely altering how readily negotiators claim value. In public goods games, players were less cooperative when interacting via email than face-to-face (Naquin *et al.*, 2008). They also tended to be more self-focused and more readily generated lines of reasoning justifying decisions against cooperating. That self-focus indicates a greater tendency to leverage power, ultimately enabling more value claiming than in a face-to-face context.

Our aim was to better understand the determinants of power realization in a multiparty negotiation context. We do so by studying how communication medium and personality influence powerful negotiator's outcomes. Research has generated some findings about media effects (for a review, see Geiger, 2020) and the role of personality (Sharma *et al.*, 2013). However, they have mostly involved dyadic interactions, or investigated those factors in isolation, leading to fragmented perspectives on their influence. Furthermore, no study has attempted to examine their joint effect under varying negotiation structures. We sought to understand how powerful negotiators' attempts to claim value is facilitated by face-to-face vs computer-mediated communication, their level of assertiveness and structure that does not allow vs. allow their exclusion in a coalition.

2. Conceptual background and hypotheses

Recent analysis of research designs in negotiation research highlights widespread reliance on laboratory experiments (Jang *et al.*, 2018). The benefits of a laboratory context include the opportunity for control, randomization to establish causality and precision of measurement. But a limitation reflects the necessity of building a closed system within which negotiation unfolds. Experimenter choices in constructing that closed system could relax different constraints to better understand how they impact open system dynamics in the field. But because certain features, like the use of dyadic designs, recur on a nearly universal basis, studies to date yield less insight than they should (Bendersky and McGinn, 2010).

One feature of negotiation research impedes wider understanding of bargaining power and its exploitation. Experimenters often impose power exogenously by assigning some participants superior outside alternatives – granting the participant a BATNA of a specific value. For example, [Brett *et al.* \(1996\)](#) inform participants about their alternative in an employment negotiation, valued at 4,500 points as an alternative to reaching an agreement. This closed system feature has provided considerable insight into the bargaining phase of negotiation ([Pinkley *et al.*, 2019](#)). The ubiquity of the practice of assigning a fixed BATNA leaves unexamined the process of cultivating and using alternatives.

In complex deal making, identification, cultivation and valuation of alternatives to negotiated agreement entails an interactive multiparty process. The BATNA is best conceived as a risky choice with probabilistic payoffs ([Pinkley *et al.*, 2019](#)). Developing alternatives requires initiating some communication with another counterpart and potentially advancing toward a tentative agreement. Such interactions comprise “the invisible third” at the bargaining table ([Giebels *et al.*, 1998](#)). A laboratory experiment requires more than two parties to simulate this open system context.

By moving to a multiparty context, we study how powerful negotiators leverage their alternatives both in computer-mediated and face-to-face contexts. We also consider how negotiation structure and personality facilitate or hinder efforts to translate potential to realized bargaining power. Research has examined the effects of communication medium and personality in isolation ([Geiger, 2020](#); [Sharma *et al.*, 2013](#)). We argue that this approach may generate disparate patterns of results because effects involving communication medium and personality should be contingent on negotiation structure. We first describe the multiparty contexts we study. Then we summarize research to date on media effects in negotiation and discuss how they influence power realization. We then theorize about the contingent influence of personality on negotiation outcomes.

2.1 Negotiation structure and apex negotiators

Structure in a multiparty context dictates how much value one can bring to a coalition. We study power realization in the context of highly asymmetric apex negotiations. In these situations, the apex negotiator enjoys superior alternatives. These take the form of potential coalition options of greater value than available to other negotiators. Threats, whether explicit or implied, to exercise one or more alternatives affords the leverage needed to claim value.

Power asymmetry falls along a continuum. At one extreme, the most powerful individual (the “apex” negotiator [[1](#)]) enjoys a monopoly over value creation. This is the case in a design described by [Murnighan and Roth \(1977\)](#). The apex bargains with two less powerful counterparts, called “base” negotiators. No single negotiator can generate value acting alone, and value can be generated only by bringing together the apex with at least one of the two base negotiators. To close a deal, the pair must decide how to divide 100 units of value. This structure implies that the apex should be free to bargain aggressively with no concern for being excluded from a valued coalition. It reflects situations where one party has monopoly power and others lack alternatives (e.g. patent holders who have multiple alternatives for manufacturing partners).

At another point in the continuum is a design described by [Funk *et al.* \(1980\)](#).

The apex no longer holds a monopoly on coalition formation because the base negotiators have the alternative of working together to close a deal that excludes the apex. The apex can offer a more favorable share of points than available in an all-base coalition, but that necessitates blocking such alliances. This structure reflects situations where powerful negotiators can be excluded entirely (e.g. producers who have the capability to replace intermediaries and sell directly to consumers). In the next section, we summarize research on communication media and theorize about their effects in the contexts we study.

2.2 Communication media effects in negotiation

Reflecting the growing prevalence of distance communication channels, research on media effects in negotiation continues to grow. [Daft and Lengel \(1986\)](#) conceptually distinguished between different forms of media based on “richness” in carrying information load. Face-to-face conversations convey far more nonverbal as well as verbal information than electronic forms. From the media richness perspective, the additional visual and auditory signals should enhance most work product requiring social exchange and coordination. [McGrath and Hollingshead \(1994\)](#) theorized that efficacy of media depends on the characteristics of the group task, since tasks can impose quite different forms of interdependence. They also concluded that channel richness yields benefits for negotiating tasks.

Empirical tests of these propositions generated mixed results. [Geiger \(2020\)](#) searched major academic databases and prior literature reviews up through mid-2019 to find 98 empirical studies of media effects on negotiation. Nearly all of these studies examined two-party bargaining. The relatively small number of coalition experiments used a wide range of contrasting media channels. Some examined coalition formation in face-to-face negotiation ([Kalisch et al., 1952](#); [Selten and Schuster, 1968](#)). Others constrained communication through written message passing physically conveyed by the experimenter ([Murnighan and Roth, 1977, 1980](#)) and still more deployed some form of digital text messaging ([Bottom et al., 2000](#); [Croson et al., 2004](#); [Funk et al., 1980](#)).

Only six studies published by three different research teams randomly manipulated media. These studies primarily focused on collective outcome efficacy in situations that varied in symmetry ([Barkhi et al., 1999 and 2004](#); [Arunachalam and Dilla, 1992 and 1995](#); [Diermeier et al., 2008](#); [Swaab et al., 2009](#)), but they did not focus on how individuals use power. In a multiparty collective optimization problem, [Barkhi et al. \(1999, 2004\)](#) observed that electronic communication led to agreements further from the efficient frontier. In part, this efficiency loss stemmed from less truthful communication exchange between parties.

[Diermeier et al. \(2008\)](#) assigned triads to negotiate a game via face-to-face or through electronic media. The primary research question concerned the efficiency of agreements. The most efficient agreement included all members. Computer-mediated communication greatly increased inefficiencies because it resulted in fewer grand coalitions. [Diermeier et al. \(2008\)](#) also identified private conversations to be a feature of computer-mediated communication that likely facilitates attempts to leverage power. Private conversations can readily arise in either computer-mediated or face-to-face situations. A powerful apex negotiator should be able to use private conversations to more easily engage in the back-and-forth objection and counter-objection process of argumentation about share size that fully leverages their superior alternatives ([Aumann and Maschler, 1961](#)). In the face-to-face context, attempts to initiate a private conversation will itself be public, heightening concern and arousing suspicion.

This research team followed up with a study using the same design ([Swaab et al., 2009](#)) and measured the distribution of outcomes to each party. Electronic communication again diminished efficiency. In a second study, they examined the content of the discourse that might be related to a coalition formation process that excludes some negotiators. By using the Linguistic Inquiry Word Count (LIWC) software ([Pennebaker et al., 2001](#)), they observed that expressing positive emotions in public conversations correlated with the formation of grand coalitions. The limited amount of empirical evidence would suggest that apex negotiators with highly asymmetric power would find it easier to expropriate value in the digital context. This is because digital communication places greater demands on base negotiators.

Base negotiators have greater need to form and maintain relationships because of their limited alternatives. To exercise any of those alternatives, they must coordinate and execute a joint strategy. Rich contextual information exchanged in face-to-face situations facilitate these efforts. Coalitions that block the apex can form more readily when it is easier for people to talk to each other. Communication constraints on less powerful negotiators resulted in them claiming less value (Bolton *et al.*, 2003; Murnighan and Roth, 1977). Difficulty building coalitions may explain why communicating through a computer interface limits less powerful negotiators' coordination against a more powerful negotiator (Wilson *et al.*, 2006). These findings suggest apex negotiators should claim more value in computer-mediated than face-to-face negotiations:

- H1. Across game contexts, apex negotiators are likely to exploit their power to claim more value in computer-mediated than face-to-face negotiations.

2.3 The role of assertiveness in value claiming

Research has linked aspects of extraversion to value claiming. Extraversion is a personality factor that describes tendencies to be active, dominant, sociable, expressive and feel positive emotions (John and Srivastava, 1999). Although a meta-analysis of mostly dyadic studies showed no association between extraversion and outcomes in a laboratory context (Sharma *et al.*, 2013), the same paper also highlighted two field studies that do suggest an association. Harris and Mowen (2001) identified a correlation between extraversion and propensity to complain, an indicator of initiating negotiations. Pulido-Martos *et al.* (2013) demonstrated a link between trait extraversion and power utilization among employees in a range of industries. In a later study, Sharma *et al.* (2018) showed that higher scores on the Hogan Personality Assessment concept of "ambition" positively correlated with higher supervisor ratings of negotiation effectiveness among professionals. Ambition is an aspect of extraversion that represents the tendency to be self-confident, display leadership, compete with others and being energetic (Hogan Assessments, 2021). A closely related concept is assertiveness, which reflects "dominance, forcefulness, social ascendancy, and leadership" (Herringer, 1998, p. 731). These characteristics should facilitate the back-and-forth process of arguments required to leverage the value of alternative coalitions.

Foundational multiparty studies provide further evidence of assertiveness facilitating value claiming. Prominent game theorists tested solution concepts for coalition bargaining (Kalisch *et al.*, 1952). Striking deviations from predicted outcomes convinced researchers that personality played a role: "Aggressiveness played a role even in the first formation of a coalition and who yelled first and loudest made a difference in the outcome" (pp. 16–17). In later experiments, Siegel and Fouraker (1960, p. 52) also concluded: "[...] toughness (as manifested by unwillingness to yield or make concessions to one's rival) and related psychological attributes may be the important determinants of differential payoff, and thus of negotiated price". Selten and Schuster (1968) used an informal questionnaire of personality and they too found evidence for associations involving what appears to be assertiveness. Murnighan and Roth (1977, 1978) found the same pattern of deviations that appeared systematically linked to stable personality traits like assertiveness in multiparty games. Selten and Schuster's psychometrically questionable measure aside, no one has yet published research examining coalition bargaining with a validated instrument measuring personality. When the closed system assumption of a rigid dyad for bargaining is relaxed in the field or laboratory, evidence suggests assertiveness predicts power utilization and outcomes.

2.4 An interactionist perspective on leveraging bargaining behavior

We build on this research to suggest assertiveness may not facilitate value claiming in all situations. According to the interactionist perspective on personality (Endler and Magnusson, 1976; Terborg, 1981), traits functional in one context may prove much less so or even dysfunctional in others. One behavioral determinant comprises the person's cognitive, affective and motivational factors; the other represents situations that entail greater potential for certain actions to be produced over others. Considering interaction between person and situation factors provides a fuller account of performance than either in isolation (Caldwell and O'Reilly, 1990).

The interactionist view would suggest that the possibility of being excluded from a coalition influences the relationship between personality and value claiming. Behavior expression will remain consistent but their observable manifestation in coalitions, deal terms and value claimed will vary. If powerful negotiators cannot be excluded from a value creating coalition, then assertive negotiators will expropriate more value by working back and forth between potential partners to improve the terms. But when it is possible for base negotiators to exclude the powerful, even at a cost, assertive behavior will yield less in value claimed. Across time and culture, people have sought to punish those who attempt to assert dominance, reflecting what Boehm (1997) deemed reverse dominance hierarchy. The provision of a structure that allows such reprisal should hinder the apex negotiator's attempts to claim value:

- H2.* When powerful negotiators cannot be excluded from the value-creating coalition, assertiveness is likely to translate into their ability to claim value for themselves.
- H3.* When powerful negotiators can be excluded from the value-creating coalition, assertiveness is likely to impair their ability to claim value for themselves.

Assertiveness should be evident in multiple behavioral patterns. Personality traits, as with other individual difference variables, do not predict specific behaviors. Rather, they predict choices from categories or families of similar actions (Fishbein and Ajzen, 1974). As Jaccard (1974) explained, "personality measures should be systematically related to multiple act criteria, but not necessarily to any single act criteria" (p. 358). Thus, we sought to construct an index that reflects different ways that assertiveness may be expressed.

This should include greater volume of communication, which allows negotiators to fully articulate arguments and counter influence attempts. In terms of specific word choices, social psychologists identify pronoun use as an indicator of power. Repeated investigations have found that use of first-person plural pronouns (e.g. "we") is greater among those with more power or those who have been situationally primed to a state of feeling powerful (Kacwicz *et al.*, 2014). This pattern has been corroborated independently in multiple studies (Meinecke and Kauffeld, 2019; Van Swol and Kane, 2019). Beyond specific word use, the content of messages can indicate assertiveness. In studying the communication patterns in a coalition game, McGinn *et al.* (2012) identified messages they deemed "competitive talk" (e.g. "the stronger player ought to get a larger piece of the pie"). These were linked to settlements that disproportionately favored one party. In addition to linguistic cues, offer patterns can signal assertiveness. An assertive pattern would be to repeat previously stated demands without altering them (Filzmoser and Vetschera, 2008). These indicators represent multiple pathways to assertive action. Tinsley *et al.* (2002) referred to those pursuing asymmetric advantage as "typical hard bargaining." Robinson *et al.* (2000) measured "traditional hard bargaining" as making an extremely favorable first offer, exerting time pressure and

undermining the counterpart's confidence. Consistent with prior use, we use the label "hard bargaining index" to represent these behaviors:

- H4.* Across both contexts, trait assertiveness should be positively associated with actions taken from the hard bargaining index.
- H5.* Hard-bargaining behavior will mediate the effect of assertiveness on value claiming when the apex negotiation cannot be excluded from a value-creating coalition.

3. Study 1

3.1 Method

To examine extreme power asymmetry, an apex negotiator with a monopoly over coalitions, we designed a laboratory experiment manipulating medium of communication, which was either face-to-face or computer-mediated. Participants negotiated to form coalitions and allocate value they created.

3.1.1 Power analysis. We conducted power analyses using G*Power (Faul *et al.*, 2009) to determine the sample size. For communication medium, we expected a moderate effect. Arunachalam and Dilla (1992, 1995) reported double the inequality in outcomes through computer-mediated compared to face-to-face negotiation. McGinn and Keros (2002) reported that the distribution of surplus was eight times more unequal when negotiating via email vs. face-to-face. For the relationship between assertiveness and value claimed, we also expected a moderate effect size, based on qualitative descriptions provided by Kalisch *et al.* (1952). Aiming for 80% power, 5% false positive rate and a correlation of 0.40, $N = 46$ would be required. We sought to recruit more apex negotiators than this for both studies.

3.1.2 Participants. One hundred and eighty undergraduate students ($M_{age} = 19.36$, $SD_{age} = 1.03$, 41% female) from a private, mid-sized Midwestern University participated in this study. They received course credit as well as cash contingent on the outcome of the negotiation. Data from five triads were lost to a technical error; the program failed to record results for this session leaving $N = 165$. To investigate wielding power, we analyze the apex negotiator's behavior and outcomes, $N = 55$ ($M_{age} = 19.42$, $SD_{age} = 1.12$, 38% female).

3.1.3 Experiment design and procedure. Participants completed an online survey containing a personality measure and demographics questions approximately one week before taking part in the laboratory experiment. The survey was completed at a time and location of the participant's choosing.

After arriving at the laboratory, participants were randomly assigned to a triad and a role. Triads were randomly assigned to a communication medium. Those assigned to the face-to-face condition moved into a private meeting room with laptops through which instructions were delivered and offers could be made. They were video recorded with later transcription of the verbal exchange. Those in the computer-mediated condition were assigned to cubicles that impeded identification of counterparts. In the computer-mediated condition, participants could communicate only via text messaging. The monopoly bargaining task was described in the same context of a "shoe selling" problem that Murnighan and Roth (1977) devised. The apex was assigned the right shoe with the two bases assigned a left shoe each. To profit from selling a pair of shoes, any value creating coalition must pair a right shoe with a left. Coalition members decided how to allocate 100 points among them. Letting A represent the apex negotiator, B and C represent the base negotiators, the characteristic function for this game is: $v(A)=v(B)=v(C)=v(BC)=0$; $v(AB)=v(AC)=v(ABC)=100$. Information about the value of potential coalitions, i.e. the characteristic

function, was common knowledge across all conditions. Participants completed a quiz about rules to ensure they understood the instructions [2].

Triads had ten minutes to bargain with a countdown clock visible at all times [3]. During the first five, they could communicate and propose deals. After that they could “endorse” any deal in which they received a positive share of points. The negotiators made offers on a laptop to facilitate recording. This was necessary to equalize the speed of offer making while recording systematically across the two conditions. To close an agreement, an endorsed deal required the additional step of “ratification” by all those earning positive value from the deal. Once all positive value negotiators ratified an endorsed deal it closed. Participants were then informed of the number of points they earned. Throughout the bargaining process, participants could communicate publicly with all others or privately with just one other. In the computer-mediated condition, participants could opt to send messages to all members of the triad or to a selected counterpart. In the face-to-face condition, all triad members began negotiating in the same room, with an adjacent room available for private conversations.

Once a deal was ratified, or ten minutes passed without any ratification, negotiations ended. Impasses earned no points. In the event of a ratified deal, participants were compensated in cash, with each point converting to five cents.

3.2 Measures

3.2.1 Personality variables. The pre-experiment questionnaire measured the Big Five with the widely used Analog to Multiple Broadband Inventories (AMBI; Yarkoni, 2010). Participants provided ratings on a five-point Likert-type scale (1 = very inaccurate to 5 = very accurate), with higher scores indicating greater level of that facet. We focused on the facet level measure of assertiveness ($\alpha = 0.76$, $\omega_t = 0.83$) [4]. We also computed the factor level score for extraversion ($\alpha = 0.88$, $\omega_t = 0.92$) by averaging all items that measures that factor.

3.2.2 Hard-bargaining index. The linguistic indicators comprised the number of messages sent, total word count, count of the use of the pronoun “we”, and the level of competitive talk as defined by McGinn *et al.* (2012), with higher counts of each indicator corresponding to greater hard bargaining. Following the practice using by Swaab *et al.* (2009), we counted pronoun use with the LIWC (Pennebaker *et al.*, 2015). Relying on the classification scheme devised by McGinn *et al.* (2012), competitive talk indexed statements advancing plans to exclude someone or those seeking to claim more points from the deal. Two raters, blind to the research hypotheses, assessed competitive talk using a five-point Likert-type scale (0 = *no instances of competitiveness talk* to 4 = *many instances of competitiveness talk*). They provided consistent ratings [Intraclass correlation: $ICC_{(2, k)} = 0.97$], so these were averaged. The index also included patterns of assertive offers – count of demanding offers, number of persisting offers, number of offers, average points to self in offers made, highest points to self across offers made and points to self in the first offer issued. Demanding offers reflected a counteroffer in which points to self-exceeded those in the immediately preceding offer. Persisting offers were consecutive offers where points to self-remained constant. These measures were adapted from Filzmoser and Vetschera (2008).

3.2.3 Negotiated outcome. Points claimed by the apex negotiator in the triad was the dependent variable.

3.3 Results

3.3.1 Data analysis strategy. Because some groups reached impasses, we refer to a recently published guide on analyzing them (Schweinsberg *et al.*, 2021). Schweinsberg and colleagues recommend a four-step process. The first involves reporting impasses per condition. The

second step involves predicting impasses if the theory makes claims about it. As we do not develop such theory, we exclude this step. The third step involves hypothesis testing excluding impasses. This was appropriate since our theory is interested in predicting the quality of agreements rather than predicting impasses. For completeness the fourth step involves hypothesis testing including impasses. Each step is reflected in analyses that follow.

3.3.2 Coalition formation. We report on the number of impasses per condition in Table 1. Coalition formation varied as a function of communication medium, Fisher's exact test $p < 0.001$. Apex negotiators were more likely to form minimum coalitions through computer-mediated communication than in face-to-face exchange. Six of the 55 triads failed to ratify any agreements during their session, yielding no points.

3.3.3 Descriptive statistics. Table 2 includes univariate and bivariate descriptive statistics for key study variables, and separately reports figures including and excluding impasses. Apex extraversion, computer-mediated communication, and hard bargaining positively correlated with value they claimed. Assertiveness positively correlated with hard-bargaining behavior, consistent with *H4*.

3.3.4 Leveraging bargaining power. The value claimed by apex negotiators appears in Figure 1 as a function of communication medium. The two contexts yielded a striking contrast in the distribution of rewards claimed by the apex (impasses excluded: Kolmogorov-Smirnov $D = 0.53$, $p = 0.002$; impasses included: Kolmogorov-Smirnov $D = 0.45$, $p = 0.01$). In face-to-face negotiations, apex negotiators consistently claimed a modest

Communication medium	Impasse	Apex and one base coalition	Apex and two base coalition	Total
Face-to-face	1 (0)	2 (62.50)	18 (36.28)	21
Computer-mediated	5 (0)	18 (62.67)	11 (36.00)	34
Total	6	20	29	55

Table 1.
Pattern of coalitions
formed in Study 1

Note: Numbers in parentheses represent the average points achieved by the apex negotiator

<i>Impasses excluded</i>	N	Mean	SD	1	2	3	4
1. Apex value claimed	49	46.98	16.89				
2. Computer-mediated	49	0.59	0.50	0.40**			
3. Extraversion	49	3.49	0.48	0.31*	0.13		
4. Assertiveness	49	3.57	0.69	0.28 [†]	0.01	0.79**	
5. Hard-bargaining index	49	0.00	0.55	0.34*	-0.01	0.21	0.40**
<i>Impasses included</i>	N	Mean	SD	6	7	8	9
6. Apex value claimed	55	41.85	21.73				
7. Computer-mediated	55	0.62	0.49	0.18			
8. Extraversion	55	3.49	0.46	0.23 [†]	0.16		
9. Assertiveness	55	3.55	0.68	0.25 [†]	0.06	0.79**	
10. Hard-bargaining index	55	0.00	0.57	0.15	-0.03	0.15	0.29*

Table 2.
Descriptive statistics
and correlations
among variables in
Study 1 (N = 49~55)

Notes: [†] $p < 0.10$, * $p < 0.05$, ** $p < 0.01$. Computer-mediated = 1 if in the computer-mediated condition, 0 in the face-to-face condition

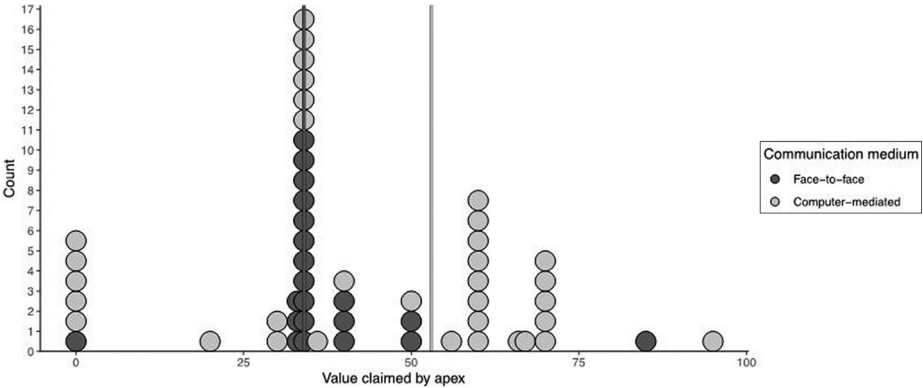
sized share of the value generated by their coalition with one exception near the right hand extreme and one impasse at the left lower bound. With computer mediation the amount of value claimed was generally much greater though the set of impasse cases increased the range considerably. This was evident in t-tests that both excluded impasses, with apex negotiators claiming more value using computer-mediated communication than face-to-face $t(47.00) = -3.22, p = .002$. This difference was not evident when including impasses $t(52.86) = -1.46, p = 0.15$. We note that the zero value of the impasse is more than two standard deviations from the mean, introducing considerable noise to the analyses. We address this issue using alternative statistical methods in a later section.

3.3.5 Hard bargaining behavior. We examined the factor structure of the hard-bargaining items. The Kaiser–Meyer–Olkin test of sampling adequacy ($MSA = 0.56$) indicates sufficient common variance to justify factoring. Bartlett’s test of sphericity, $\chi^2(55) = 583.25, p < 0.001$, rejects the hypothesis that the covariance matrix is an identity matrix, also justifying factor analysis. Parallel analysis (Humphreys and Montanelli, 1975) pointed to a three-factor solution. These extracted factors were rotated using the Oblimin method. We labelled the first factor “offering” reflecting high loadings for average value of points claimed for self in offers, highest amount of points allocated to self among offers issued, and value of points allocated to self in the first offer ($\alpha = 0.98, \omega_t = 0.98$; 37% of variance explained). We labelled the second factor “messaging” reflecting high loadings for number of messages sent, use of the pronoun “we”, total word count and competitive talk ($\alpha = 0.81, \omega_t = 0.70$; 32% of variance explained). We labelled the third factor “demanding” comprising number of demands made, number of persistent demands made and number of offers issued ($\alpha = 0.91, \omega_t = 0.95$; 30% of variance explained). We computed a total hard-bargaining behavior index by standardizing messaging, demanding and offering items then averaging ($\alpha = 0.64, \omega_t = 0.94$).

3.3.6 Regressing settlement value on assertiveness and hard bargaining. Reflecting the third step of Schweinsberg and colleagues’ (2021) recommendations, we regressed value claimed by the apex negotiator on communication medium and trait assertiveness excluding impasses. Estimates are shown in Table 3. Model 2 shows that trait assertiveness was a significant predictor of value claimed supporting *H2*.

We also conducted analyses including impasses. In reviewing the distribution of the settlements, we note a bimodal distribution, with one peak around impasse and another around a focal point at 34 points. The non-normal distribution made OLS analyses inappropriate, as the presence of outliers can lead to biased estimates (Berk, 1990). Non-

Figure 1. Dotpot of value claimed by apex negotiator in Study 1. Individual dots indicate outcomes. Vertical lines represent median value claimed by condition



Variables	Apex value claimed				Multiparty negotiations
	1	2	3	4	
Computer-mediated	0.40**	0.40**	0.40**	0.40**	Table 3. Predictors of apex value claimed in Study 1
Assertiveness		0.27*		0.16	
Hard bargaining index			0.34**	0.28*	
Constant	0.00	0.00	0.00	0.00	
Observations	49	49	49	49	
R^2	0.16	0.24	0.28	0.30	
Adjusted R^2	0.14	0.20	0.25	0.26	
df	1, 47	2, 46	2, 46	3, 45	
F Statistic	9.02**	7.08**	8.94**	6.48**	

Notes: Standardized coefficients are displayed. † $p < 0.10$, * $p < 0.05$, ** $p < 0.01$. Computer-mediated = 1 if in the computer-mediated condition, 0 in the face-to-face condition

parametric analyses were not appropriate as 87% of settlements were tied observations. They present issues for non-parametric analyses as assumptions usually involve the absence of ties (Dickhaus, 2018; Pratt and Gibbons, 1981). Instead, we conducted robust regression as they do not rely on a least-squares assumption. Robust regression allows analysis of data that are influential, but still contain useful information (Berk, 1990). Robust regression achieves unbiased estimates by assigning less weight to influential datapoints (Huynh, 1982). We conducted robust regression with settlement as the dependent variable and communication medium and assertiveness as independent variables. This revealed a significant effect of the computer-mediated condition ($B = 10.61, p = 0.047$), supporting $H1$. Assertiveness was marginally associated with greater value claimed ($B = 6.94, p = 0.07$). Examining weights assigned to data revealed that the five impasses in the computer-mediated condition were assigned the smallest weight, followed by apexes who achieved high value claimed (*apex value claimed*: 95 and 85). After appropriately weighting extreme values at both ends of the distribution, we obtain similar results as when we excluded impasses.

3.3.7 Mediation test. Hard-bargaining behavior mediated the relationship between assertiveness and value claimed. We tested the indirect effect using the Monte Carlo method for assessing mediation (Selig and Preacher, 2008), in which random draws from the joint effect of the mediating pathways are simulated, then the product computed. In Step 1, we regressed apex value claimed on assertiveness ($B = 6.64, p = 0.04$) in a model that also controlled for the main effect of communication medium. In Step 2, we regressed hard bargaining on assertiveness ($B = 0.32, p = 0.01$), controlling for the main effect of communication medium. In Step 3, we regressed outcomes on all predictor variables, resulting in a significant effect of the hard-bargaining index ($B = 8.55, p = 0.04$), but a non-significant coefficient for assertiveness ($B = 3.92, p = 0.24$). To estimate the indirect effect, we computed 20,000 iterations of the path between the independent variable to the mediator, and the mediator to the dependent variable, controlling for the independent variable. Results indicated that the 95% confidence interval for the indirect effect excluded zero (*indirect effect* = 2.72, 95% CI = 0.08~6.51). This is consistent with $H5$ and the results are shown graphically in Figure 2.

The higher-order factor level measure of trait extraversion did not positively impact value claimed through the mediator of hard bargaining. Analysis resulted in a non-

significant path between that extraversion and hard-bargaining ($B = 0.24, p = 0.16$), together with a non-significant indirect effect (*indirect effect* = 2.27, 95% $CI = -0.77 \sim 6.82$). Conducting similar analyses including impasses revealed a non-significant indirect effect of assertiveness through hard bargaining (*indirect effect* = 0.83, 95% $CI = -1.82 \sim 4.12$), and a non-significant indirect effect of extraversion through hard bargaining (*indirect effect* = 0.93, 95% $CI = -1.57 \sim 4.87$).

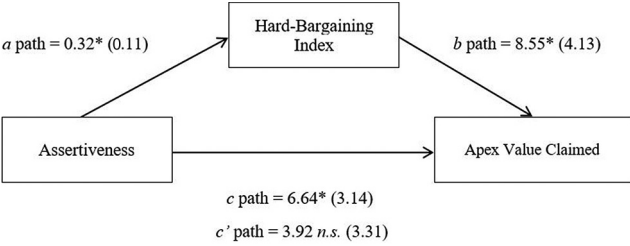
3.4 Discussion

Media exerts considerable influence over the exercise of bargaining power culminating in very different coalitions with very different patterns of value distribution depending on channel. Asymmetrically powerful apex negotiators more often established grand coalitions when working together face-to-face. Taking advantage of the social distance afforded by computer-mediated communication, apex negotiators expropriated more value while generally excluding one of the base negotiators.

Game theorists who conducted foundational studies (Kalisch *et al.*, 1952) speculated that assertive personality endows an advantage in bargaining to form coalitions when there are more than two parties. After more than half a century, we finally tested their hypothesis using a well-validated measure of assertiveness. Assertive negotiators were more effective at leveraging the power afforded to them by attractive BATNAs to claim value. They did so by deploying a range of behaviors including more demanding first offers, greater persistence with offers and more competitive verbal phrasing. Assertiveness facilitates the kind of back-and-forth exchange with different coalition partners that Aumann and Maschler (1961) used to prove the “bargaining set” solution concept.

By convention, negotiation researchers exclude impasses from statistical analyses. By analyzing the data both with and without such cases, we gained further insight into media effects on power utilization. Inclusion reveals that computer-mediated negotiation generated a second peak for value claimed by apex at the lower bound. That additional peak at zero biased standard OLS estimation, necessitating robust regression methods. From a methodological standpoint, the new convention in negotiation research should incorporate a similar approach to handling impasses. From a conceptual standpoint, spike in impasses for computer-mediated negotiation points toward a social limit on the exercise of bargaining power. The content of the transcripts reveals why groups impassed. Representative of impasses were verbal exchanges with profanity “youre a b*tch so its ok if you lose too” [5]. Schweinsberg and colleagues (2021),

Figure 2. Mediation effect of hard-bargaining index on the relationship between assertiveness and individual negotiators’ settlement value in Study 1. Unstandardized coefficients are shown, with standard errors in parentheses



Note: n.s = non-significant. $p < 0.10$, $*p < 0.05$, $**p < 0.01$

in their Impasse Type, Cause and Resolution model, suggest impasses can be the product of tough negotiations in which anger is expressed. Such outcomes are “forced” – desired by at least one party. The base negotiators sought to punish apexes who dominated them and preferred to arrive at a highly inefficient outcome to spite the apex.

The impasses also illustrate an impulse to enforce egalitarian norms. Those who try to leverage power or to claim disproportionate value attracted reprisals across regions and eras. Extensive examination of small-scale societies reveals numerous social mechanisms meant to moderate those who try to leverage power, including criticism, disobedience, exile and even execution (Boehm, 1993). Such leveling mechanisms clearly continue to function in small group face-to-face negotiations. Modern technologies for distance negotiation complicate the practice of leveling but do not eliminate it. Base negotiators were willing to accept zero value to “whittle” (Bohannon, 1958) the apex down to equality.

Study 1 endowed apex negotiators with a particularly extreme form of asymmetric bargaining power. In Study 2, we curb this asymmetry, providing base negotiators with an opportunity to level without incurring zero valued outcomes. We aimed to learn whether assertiveness continues to express itself through hard bargaining behavior and whether the computer-mediated channel still facilitates leveraging of bargaining power.

4. Study 2

In Study 2, we examined the effects of communication medium and personality when apex negotiators face some exclusion risk. The potential for an all-base coalition in this context should alter bargaining dynamics. We hypothesize that even when apex negotiators can be excluded trait assertiveness will continue to be expressed through hard bargaining behavior. But it will no longer yield an advantage in value claiming due to potential leveling by base negotiators. The effect of communication media should still yield advantages to the apex.

4.1 Method

4.1.1 Power analysis. Similar to Study 1, we aimed for 80% power, 5% false positive rate, and a correlation of 0.40. To achieve this moderate effect size, we recruited more than the required 46 apex negotiators in Study 2.

4.1.2 Participants. Three hundred and forty undergraduate students ($M_{age} = 19.44$, $SD_{age} = 1.30$, 50% female) from a private, mid-sized Midwestern University participated in this study. Participants received course credit as well as cash contingent on the negotiated outcome. Eighty-five apex negotiators were the focus of our study ($M_{age} = 19.41$, $SD_{age} = 1.39$, 46% female).

4.1.3 Experiment design and procedure. Procedures were similar to those in Study 1. Participants completed the same personality and demographics measure approximately one week before the laboratory session. After arriving at the laboratory, they were randomly assigned to groups of four, a role, and communication medium [6].

The bargaining task was adapted from the characteristic function form game studied by Funk *et al.* (1980). Each group consisted of an apex with three base negotiators. Negotiators could create points by forming coalitions with others; none of the negotiators could generate value by acting unilaterally. The apex could form a two-person coalition with any one of the three bases. Any of the three possible two-person coalitions between apex and a base generated 110 points in value. Members had to decide how to divide points generated by any proposed coalition. The three bases could form a coalition excluding the apex to generate 150 points. Letting A represent the apex negotiator and B , C and D the bases, the characteristic function took the form: $v(A)=v(B)=v(C)=v(D)=v(ABCD)=0$; $v(AB)=v(AC)=v(AD)=110$; $v(BCD)=150$. Information about the potential coalitions and possible point values was common knowledge across all conditions.

Due to random assignment, slightly more groups were assigned to computer-mediated (44 groups) than face-to-face negotiations (41 groups). Most of the features of the bargaining process remained identical to Study 1. In the computer-mediated condition, base negotiators had the option to communicate with the apex, or amongst themselves at the exclusion of the apex. No base could engage in direct dyadic communication with just one other base. In the face-to-face condition, all negotiators began negotiating in the same room, and an adjacent room was available for conferring privately. As in Study 1, one point earned converted to five cents in cash compensation.

4.2 Measures

4.2.1 *Personality variables.* As in Study 1, we measured facet level of assertiveness ($\alpha = 0.75$, $\omega_t = 0.79$) using the AMBI (Yarkoni, 2010) as well as extraversion ($\alpha = 0.90$, $\omega_t = 0.92$).

4.2.2 *Hard-bargaining index.* Hard-bargaining behavior was calculated as in Study 1. Two raters blind to study hypotheses achieved an acceptable level of interrater reliability in rating competitive talk [$ICC_{(2, k)} = 0.78$]. Raters resolved disagreements (difference in rating of 2 or more points on a five-point Likert-type scale) in ratings through discussion. Once those differences were resolved, the average of the two raters' scores were used.

4.2.3 *Negotiated outcome.* Our primary dependent measure was points claimed by apex negotiators.

4.3 Results

4.3.1 *Coalition formation.* Table 4 shows the pattern of coalition formation across communication medium. None of the groups reached an impasse. Communication medium again altered the pattern, Fisher's exact test $p = .02$. Many apex negotiators claimed no value, particularly in the face-to-face condition. The distribution of value was comparatively egalitarian when coalitions were formed. Base negotiators appear to have curtailed apex negotiators' ability to leverage the structural advantage. Figure 3 shows the distribution of outcome values by condition

4.3.2 *Descriptive statistics.* Table 5 provides means, standard deviations, and correlations between study variables. Replicating Study 1, trait assertiveness positively correlated with hard-bargaining behavior, supporting $H4$.

4.3.3 *Hard-bargaining index.* Internal consistencies for behaviors identified in Study 1 proved adequate (messaging $\alpha = 0.61$, $\omega_t = 0.74$; offering $\alpha = 0.97$, $\omega_t = 0.97$; demanding $\alpha = 0.83$, $\omega_t = 0.95$). We standardized each component before averaging to form a composite ($\alpha = 0.72$, $\omega_t = 0.90$).

4.3.4 *Regressing value claimed on assertiveness and communication medium.* Apex negotiators again claimed more value in the computer-mediated condition, supporting $H1$.

Communication medium	Impasse	Apex and base coalition	All base coalition	Total
Face-to-face	0 (0)	19 (52.47)	22 (0)	41
Computer-mediated	0 (0)	32 (53.88)	12 (0)	44
Total	0	51	34	85

Table 4.

Pattern of coalitions formed in Study 2

Notes: Numbers in parentheses represent the average points achieved by the apex negotiator. Computer-mediated = 1 if in the computer-mediated condition, 0 in the face-to-face condition

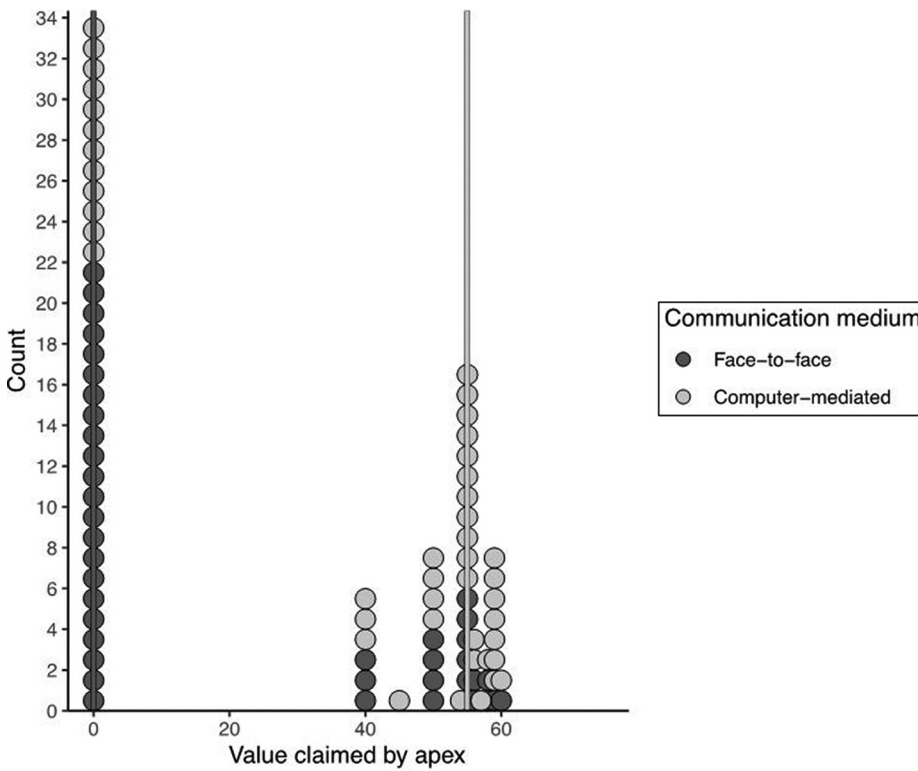


Figure 3. Dotplot of value claimed by apex negotiator in Study 2. Individual dots indicate outcomes. Vertical lines represent median value claimed by condition

We estimated a series of models, regressing points achieved on communication medium and assertiveness. Results appear in Table 6. We found no support for *H3*. Assertiveness of apex negotiators did not predict value claiming.

4.3.5 Mediation tests. We performed the mediation test as in Study 1, with assertiveness as the independent variable, hard bargaining as the mediating variable and value claimed as the dependent variable, controlling for communication medium condition. The indirect effect was not significant (*indirect effect* = 1.39, 95% *CI* = -0.39~4.23). Separate and similar analysis for extraversion (*indirect effect* = 1.06, 95% *CI* = -0.81~4.17) showed non-significant results.

Variables	Mean	SD	1	2	3	4
1. Apex value claimed	32.01	26.68				
2. Computer-mediated	0.52	0.50	0.28**			
3. Extraversion	3.55	0.53	0.03	-0.10		
4. Assertiveness	3.59	0.71	-0.07	-0.08	0.65**	
5. Hard-bargaining index	0.00	0.65	0.13	-0.08	0.15	0.22*

Notes: † $p < 0.10$, * $p < 0.05$, ** $p < 0.01$. Computer-mediated = 1 if in the computer-mediated condition, 0 in the face-to-face condition

Table 5. Descriptive statistics and correlations among variables in Study 2 ($N = 85$)

Table 6.
Predictors of apex
value claimed in
Study 2

Variables	Apex value claimed			
	1	2	3	4
Computer-mediated	0.28**	0.28*	0.29**	0.29**
Assertiveness		−0.05		−0.09
Hard bargaining index			0.15	0.17
Constant	0.00	0.00	0.00	0.00
Observations	85	85	85	85
R ²	0.08	0.08	0.10	0.11
Adjusted R ²	0.07	0.06	0.08	0.08
df	1, 83	2, 82	2, 82	3, 81
F Statistic	7.06**	3.61*	4.60*	3.27*
Notes: Standardized coefficients are displayed. † <i>p</i> < 0.10, * <i>p</i> < 0.05, ** <i>p</i> < 0.01. Computer-mediated = 1 if in the computer-mediated condition, 0 in the face-to-face condition				

4.4 Discussion

Even without enjoying a full monopoly over value creation, apex negotiators claimed larger shares of value when bargaining over digital media. Similar to the description provided by Bohannan (1958) of less powerful “whittling down” the powerful, base negotiators were able to use levelling mechanisms effectively when they had the opportunity to work together to exclude the apex while still creating value. Swaab *et al.* (2009) found rates of exclusion of one party in their three party negotiation problems increased when communication was computer-mediated. But in the context of the far more modest asymmetries of bargaining power they examined, the excluded party was generally one of the base negotiators rather than the more powerful. In this study, leveling often succeeded in locking the apex negotiator out of agreements, especially in the face-to-face condition. Trait assertiveness once again led apex negotiators to deploy choices from the same hard bargaining behaviors as in Study 1. The absence of monopoly power over coalition formation, however, left them much more vulnerable to base leveling.

5. General discussion

Increasing reliance on digital communication, exacerbated by the COVID-19 pandemic, has implications for how power is used. It has the effect of concentrating power to those with structural advantage, and thus has the potential to increase inequality. Across two different negotiation structures, we observe communication technology to negatively influence the leveling mechanisms found in face-to-face contexts. The richness of communication media matter when attempting to leverage alternatives.

From a research standpoint, the present investigation contributes to a necessary step away from rigid closed system constraints (Bendersky and McGinn, 2010) that greatly facilitated past advances in negotiation research but prevent a fuller understanding of bargaining power. Further insights about the impact of BATNA will require more researchers begin moving away from the dyadic setup. We now better understand how people respond to different forms of bargaining power.

Exploiting asymmetrically attractive BATNAs depends on personality as well as the medium for communication and the full extent of bargaining power. Assertive apex negotiators more readily engaged in hard bargaining behaviors necessary to leverage power. Powerful negotiators found value claiming easier to accomplish when

communicating via computer-mediated channels. Computer-mediated communication served as a barrier hindering the base negotiators from coordinating with one another. This enabled the apex negotiators to claim more value in both the three-party context of Study 1, where they held a monopoly on value creating coalition formation, and in the less asymmetrical four-party context of Study 2.

Face-to-face communication resulted in greater likelihood of generating egalitarian outcomes, consistent with the logic of reverse dominance hierarchy (Boehm, 1997). Given that negotiators have some discretion in choosing a communication medium for bargaining, those in a greater position of power may opt for channels that impose greater social distance between parties. Those lacking structural sources of power, like these studies' base negotiators, should choose to work through media where natural egalitarian tendencies are easier to invoke or affords readier formation of blocking coalitions. They may supplement bargaining over a reduced context medium by interacting with the counterpart with a richer medium before bargaining begins (Morris *et al.*, 2002). Such actions would be helpful in developing familiarity and similarity, aspects that have been found to be critical for success in multiparty negotiations conducted through email (Kurtzberg *et al.*, 2005).

5.1 Personality and situation fit in multiparty contexts

Alternatives to negotiated agreement generally take the form of negotiating an agreement with another party. Fully realizing this potential power requires the willingness and capability to initiate and cultivate negotiations with multiple parties in parallel. Prominent game theorists including Nash, Roth and Selten have persistently suggested that assertive personality traits make this task easier for some people to accomplish than others.

This research provides the first direct test of the effects of personality on coalition behavior. Prior laboratory research on personality and negotiation almost uniformly focused on dyads (Sharma *et al.*, 2013). In a recent field study, Sharma *et al.* (2018) found that supervisor ratings of negotiator effectiveness were predicted by a measure of trait assertiveness for professional workers. Those open system contexts do not rigidly constrain to a dyadic encounter with one counterpart and an exogenously determined BATNA. Negotiators who wish to develop alternatives must put in the effort of working through prospects. The coalition formation problems studied in the present paper provide a useful tool for examining these dynamics in the laboratory context. The *N*-party laboratory experiment constitutes a closed system that captures the required social dynamics in a controlled setting with precise measurement.

Assertive negotiators engaged in hard bargaining across the two studies. Without the monopoly over value creating coalitions, the same behavior that claimed more value in Study 1 failed to do so in Study 2, supporting the interactionist view of personality. Apex assertiveness translated into value claimed when assertive behavior was very costly to punish, but not when there was opportunity to punish without extreme costs. Our understanding of the behavioral manifestations of personality traits can also facilitate efforts to train and develop negotiators in specific behaviors that contribute to success in each context. Additionally, the broader factor level measure of extraversion was not systematically related to the pattern of messaging and offer making we identified, highlighting the importance of our facet-level examination.

5.2 Limitations and future directions

The experimental laboratory can continue to serve as a method for precisely measuring, controlling, and testing hypotheses about the features of negotiations. We need to recognize the impact of closed system constraints built into laboratory models of the processes. Future

research should examine dynamic BATNA development. Additionally, we encourage testing a wider variety of the open system features that shape the process in business, government and international relations.

Our findings may not generalize to all forms of multiparty bargaining. Some effects may be specific to the characteristic functions used in these two games. Our study contexts have identified some boundary conditions for the effectiveness of extraversion and its facet of assertiveness. Future research, however, should explore other characteristic functions and the personality facets that matter in situations that vary in power asymmetry.

When testing for the effects of stable personality traits, negotiation researchers should examine multi-behavior categories rather than single acts. Assertiveness consistently influences the tendency to engage in hard bargaining behavior, not necessarily any one action. It is important to predict behavior families rather than outcomes, the latter of which depends on the situation.

Another limitation across both studies is that the computer-mediated conditions and face-to-face contexts differed in some ways. The computer-mediated condition afforded the opportunity to engage in truly private conversation, whereas in the face-to-face condition, any attempt to do so would have alerted other negotiators to that fact. In addition, the face-to-face condition did not eschew computer interaction completely, as it was used to record proposals, endorsements and ratifications. Our goal was to vary the richness of the communication media, while holding all other factors consistent. It allowed precise measurement of proposals and other behaviors related to bargaining across both conditions, facilitating calculation of variables and comparison across conditions. But this resulted in the face-to-face condition being a hybrid communication. Thus, our claims about the effect of communication medium should be tempered with the acknowledgment that there was also a difference in the availability of truly private communication across conditions and the face-to-face condition being a hybrid mode. Furthermore, our design assumes that all parties are present throughout bargaining. In extended multiparty negotiations, parties may engage in private discussion away from the bargaining table, introducing a series of separate dyadic or smaller multiparty discussions to the process. Modeling such complications will further enrich understanding the dynamics of the larger process.

5.3 Implications for practice

Our findings imply negotiators can selectively use media and design structure to claim value in a multiparty context. Powerful negotiators can use digital communication to claim value since it can hinder attempts to form blocking coalitions, benefiting powerful negotiators who use digital communication. They must also consider structure. If formal mechanisms exist to exclude the powerful, attempts to expropriate value can be met with exclusion. Insight into these situational factors will allow both high and low power negotiators to better design or select bargaining terms to help claim value. For example, low power negotiators can insist on using media and structure to offset power differences. Such insights can also be used to predict when personality or specific tactics can be a source of benefit or hinderance. Having power, being assertive and bargaining hard will not always result in benefit. They can be ineffective when structure allows other negotiators to exclude the powerful. Adopting alternate tactics should prove to be more useful in such situations.

6. Conclusion

There is considerable variation in how negotiators realize bargaining power. Both situational and dispositional factors can prove consequential. New communication technologies can provide asymmetrically powerful parties greater affordance to expropriate

value. This exploitation has the potential to contribute to widening global inequality (Timmer *et al.*, 2014). We also tested conjectures by game theorists and observed personality to shape coalition formation. Personality can determine who engages in a pattern of vigorous bargaining back and forth between different alternatives to realize potential power, but expropriation depends on the structure. These studies provide a starting point for future investigations on the complex ways situation and dispositional factors influence process and outcomes. Other multiparty tasks as well as field research will be necessary to build on the current findings.

Notes

1. In cooperative game theory, apex games refer to situations in which the less powerful or “base” negotiators can negotiate positively valued deals that exclude the powerful apex negotiator (Kahan and Rapoport, 2014). Because that is not the case in Study 1, it is not an apex bargaining problem. We here borrow the term “apex” to refer to the monopolist because the term provides a simple, informative label for the asymmetrically powerful negotiator. We also use the term “base” to refer to less powerful negotiators
2. We also provided a power prime as an attempt to enhance the structural power of apex negotiators, but this manipulation had no effect on outcomes either on its own or as an interaction term with communication medium. Thus, we dropped the manipulation from further consideration. The manipulation comprised randomly selected apex negotiators to write about a time when they were in a powerful role. The remaining apex negotiators were prompted to write about events from the previous day, to serve as controls. Base negotiators were also prompted to write about their previous day. Both prompts were developed by Galinsky *et al.* (2003).
3. Before completing the first study session, the research team ran a series of practice sessions to refine implementation of the procedures. From these sessions, we concluded that ten minutes represented ample time for any negotiator to reach a deal over these issues.
4. We note that while alpha is a popular measure of reliability, it suffers from multiple issues, including underestimating reliability (Revelle and Condon, 2019; Sijtsma, 2009). Thus, we additionally report an alternate measure of reliability, Omega total, that is less affected by such issues.
5. Profanity was fully spelled out by the participants in text conversations. We have elected to amend these texts using asterisks for this submission.
6. As in Study 1, we attempted a power prime manipulation, using a similar procedure, but to enhance the effect of power priming in this study, base negotiators were asked to write about a time someone else had power over them using a prompt developed in prior research (Galinsky *et al.*, 2003). As in Study 1, this manipulation had no main effect or interaction effect with communication medium and was dropped from the analyses.

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Corresponding author

Jonathan I. Lee can be contacted at: Jonathan.Lee@UNH.edu