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A Meta-Analysis of Communication Cues in Negotiations:
The Moderating Impact of Experience with Others and Communication Technology

Abstract

The goal of this paper is to systematically examine the impact of communication cues on negotiations. The results of a series of quantitative meta-analyses show that the effects of face-to-face interaction, synchronous communication, vocal cues, and visual cues on negotiation outcomes and processes range from strongly negative to strongly positive. Importantly, the mixed, and sometimes contradictory, evidence that has characterized this field of research to date can largely be explained by the level of experience negotiators have with (a) their counterpart as well as (b) the technology. That is, the impact of communication cues on negotiation outcomes is weaker when negotiators are positively related to each other or more technologically experienced. However, the impact of communication cues is stronger when such experience is negative or absent.

KEY WORDS: Communication Cues, Negotiation Outcomes and Processes, Meta-Analysis, Communication Channels

A Meta-Analysis of Communication Cues in Negotiations:

The Moderating Impact of Experience with Others and Communication Technology

Managers today increasingly rely on a wide variety of communication media for negotiation. Interaction via phone, fax, email, and even videoconferencing has become common-place. Given the prominence of these various alternatives, it is critical to understand the effects of different media channels on communication and decision outcomes. Often, managers rely on intuition or the most easily accessible medium without being aware of the potential disadvantages that certain media and contexts may generate. Despite this increased attention, research to date has failed to provide consistent practical implications: whereas some studies reveal strong differences between communication media on whether mutually beneficial outcomes were established (Mennecke, Valacich, & Wheeler, 2000), other studies report little or no differences (McGinn & Keros, 2002). While research on communication media in negotiation has been growing rapidly, the apparently conflicting results persisted. An integration of the literature is necessary to make progress towards a solution of this puzzle.

The paper will accomplish this in three ways. First, we chart the effects of communication cues across a broad range of studies. Second, we synthesize these findings with regard to the effects that communication cues have on negotiation outcomes and processes and show how the apparently contradictory findings in the literature can be reconciled. Third, by systematizing the effects of communication cues, we provide practitioners with a rationale for the strategic use of communication media.

For Better or Worse?

Past research demonstrates that face-to-face interactions may differ from interactions via communication media (see for example Baltes, Dickson, Sherman, Bauer, & LaGanke, 2002). Evidence from negotiation researchers examining this difference, however, yields mixed results (Stuhlmacher & Citera, 2005). For instance, some studies find an advantage of face-to-face interaction, suggesting that face-to-face negotiations are less likely to end in an impasse (Purdy, Nye, & Balakrishnan, 2000) or leave less money on the table than non face-to-face negotiations (Valley, Moag, & Bazerman, 1998). On the other hand, other studies do not report such differences (Croson, 1999; Naquin & Paulson, 2003). In trying to explain the differences between face-to-face settings and Computer Mediated Communication (CMC), researchers introduced a variety of theories, including Social Presence Theory (Short, 1974), Information Richness Theory (Daft & Lengel, 1986), the Cuelessness Model (Stephenson, Ayling, & Rutter, 1976) and the Reduced Social Cues Approach (Kiesler, Siegel, & McGuire, 1984). These theories all argue that a medium's capacity to convey multiple communication cues concurrently *determines* whether people will be able to work effectively with each other. That is, the richer the medium, the more likely the interaction will be successful.

The implication of these deterministic approaches is that non face-to-face negotiations benefit when they "look" more like a face-to-face conversation by containing the presence of multiple cues (McGrath & Hollingshead, 1993). To investigate this idea, researchers focused on the difference between face-to-face interactions and non face-to-face interactions as well as the relative impact of three communication cues in particular. Specifically, they examined the ability to (a) directly respond to others' actions and words, (b) hear and speak to others, and (c) see each other. However, an integration

of the impact of each of these cues has not been conducted, so a serious question remains about the relative impact of each of these cues.

Communication Synchronicity

Inherent to face-to-face interaction is the ability to respond directly to others' actions and words. Although such communication "synchronicity" is embedded in most face-to-face meetings, it may also be present in non face-to-face settings. For example, this type of synchronicity exists when people communicate over the telephone. Communication over email on the other hand, is asynchronous and can lead to response delays of hours or even days. However, it is unclear from the research what the exact impact of synchronicity is because it may facilitate the conveyance of information as well as make it harder to validate opinions (Dennis & Valacich, 1999).

With respect to the reported impact of synchronicity on negotiations the evidence is mixed. For instance, some studies found that compared to asynchronous email negotiations, synchronous negotiations increase the likelihood of settlement (Griffith & Northcraft, 1994) while other researchers found that it had no effect (McGinn & Keros, 2002) or even decreased the outcome of negotiations (Pesendorfer & Koeszegi, 2006), directly contradicting the deterministic approach. It is also unclear how synchronicity impacts negotiation processes; some research shows it resulting in increased cooperation and information sharing (Pesendorfer & Koeszegi, 2006), while others did not find such relationships (Loewenstein, Morris, Chakravarti, Thompson, & Kopelman, 2005).

Vocal Cues

Another cue inherent to face-to-face communication is the ability to speak with others and listen to them. Such vocal cues can be present in non face-to-face settings

when people use the telephone. Importantly, vocal cues do not necessarily co-occur with synchronicity: instant messaging and a phone conversation are both synchronous but differ in the way they transmit information (i.e. by text or voice) and a voice mail has vocal cues but lacks synchronicity. Some researchers have even argued that vocal cues are indispensable for effective communication because they allow one to detect the subtleties in the messages conveyed (DePaulo, Lindsay, Malone, Muhlenbruck, Charlton, & Cooper, 2003).

However, the impact of vocal cues on negotiations appears to be mixed. Some studies show that compared to text-based negotiations, the presence of vocal cues increases settlement (Sheffield, 1995) while others do not find such differences (King & Glidewell, 1980). Similarly, some demonstrate that vocal cues positively impact cooperation and information sharing (Yuan, Head, & Du, 2003) while others do not (Purdy et al., 2000).

Visual Cues

Next to the ability to communicate synchronously and vocally, face-to-face interaction also contains visual cues allowing people to see others' nonverbal expressions. These visual cues can also be present in non face-to-face interactions, for example when a webcam is used. It has been argued that these visual cues enrich interactions because they personalize a message and foster feelings of social presence (Short, 1974; Stephenson et al., 1976). However, others have argued that visual cues may be misleading and distort the accuracy with which a message is interpreted (DePaulo & Friedman, 1998; Keltner & Ekman, 2000).

Evidence from negotiation research is also mixed: some studies show that the presence of visual cues results in mutually beneficial outcomes (Turnbull, Strickland, & Shaver, 1976) whereas others have shown the opposite (Carnevale, Pruitt, & Seilheimer, 1981). In a similar vein, it is unclear how visual cues affect negotiation processes because they sometimes increase (Schweitzer, Brodt, & Croson, 2002) and other times decrease cooperation and information sharing (Purdy et al., 2000; Yuan et al., 2003).

The mixed results in this area of research indicate that deterministic approaches cannot account for the impact these communication cues have on negotiation behavior. One possible reason for this lack of consistent evidence is that these approaches were too pre-occupied with a focus on communication cues and ignored the impact of the context in which interactions take place. More recent approaches to CMC effects argued this point and stated that the impact of communication cues can only be understood when careful attention is paid to contextual factors like the relationships between people as well as their level of expertise with the technology (Carlson & Zmud, 1994; DeSanctis & Poole, 1994; Kiesler & Kraut, 1999; Postmes, Spears, & Lea, 1998; Walther, 1996).

The Impact of Experience

Based on recent CMC approaches, we identified two contextual factors as being particularly relevant: experience with the counterpart and experience with the technology (Carlson & Zmud, 1994; Walther, 1992). As communication partners acquire relevant experience in both domains, they develop knowledge to encode and decode their messages more effectively by taking into account the limits and capabilities of the technology used as well as the characteristics of the situation and communication partners (Higgins, 1992; Krauss & Fussell, 1996). We propose that as the level of familiarity with

partner and technology increases, the influence of communication cues decreases. On the other hand, participants who do not have similar experiences will not develop the capabilities to communicate more effectively and, instead, rely more on communication cues for their interactions.

Experience with Counterpart

As individuals develop experience communicating with a specific partner, they may develop a personal relationship that can benefit their communication effectiveness (Kiesler & Kraut, 1999; Walther, 1992). Experience and familiarity with the counterpart will over time constitute a knowledge base, enabling effective encoding and decoding of messages exchanged with that person.

This has important consequences in negotiation settings because negotiators face a complex dilemma: in order to develop mutually beneficial outcomes, they must be willing to cooperate and share information but are reluctant to do so because this may weaken their position (Murnighan, Babcock, Thompson, & Pillutla, 1999). But whether the presence of communication cues contributes to the establishment of better outcomes may depend on the experience negotiators have with each other. For example, the dispute resolution literature has shown that direct (and early) contact between negotiators with negative relationships *decreases* the likelihood of settlement (Goldberg, 2005; Swaab & Brett, 2007). At the same time, others have shown that the presence of communication cues does not impact negotiations at all when negotiators are positively related to each other (Moore, Kurtzberg, Thompson, & Morris, 1999).

Taken together, the above implies that presence of communication cues has a negative impact on negotiations when negotiators' experiences with each other are

negative, has no impact when these experiences are positive, and has a positive impact when the experience is absent.

Hypothesis 1: The impact of face-to-face interaction, synchronicity, vocal cues, and visual cues on negotiation outcomes is moderated by experience with the counterpart such that the impact is (a) positive when experience with the other is absent, (b) negative when this experience is negative, and (c) absent when this experience is positive.

Experience with the Technology

As individuals develop experience using specific communication settings like instant messaging, they may develop the required knowledge to use such settings successfully (Carlson & Zmud, 1994). For example, instant messaging users may become aware of how to effectively take turns in their online conversation or how to convey emotions online. These individuals are also more likely to better understand messages received through this setting because they can interpret an increasing variety of cues. So, technological experience may impact the extent to which people are able to express themselves effectively (Carlson & Zmud, 1999).

Until recently, negotiators predominantly relied on face-to-face communication. However, according to market researchers such as Forrester and Gartner, a tipping point occurred in the year 2000 for the adoption of new technologies (e.g. over 50 percent US households with internet access, see also PEW/Internet, 2006; Sabia, 2005). This implies that not only Generation Y-ers who came of age with broadband, cell phones, and iPods have developed a hands-on approach to new technologies (Li, 2006), but also that other generations have become more capable of communicating effectively via new technologies. Taken together, this change assumes that negotiators are likely to have

more technology experience after the year 2000 than before. As a result, it can be expected that the impact of communication cues is less pronounced in studies published after the year 2000.

Hypothesis 2: The impact of face-to-face interaction, synchronicity, vocal cues, and visual cues on negotiation outcomes is moderated by experience with the technology such that the impact of these cues will be weaker for those with more technology experience and stronger for those with less technology experience.

Method

Literature Search

Standard literature search techniques were used to retrieve data on the relation between communication cues as independent variables and mutually beneficial outcomes, cooperation, and information sharing as dependent variables. Articles and doctoral dissertations (until December, 2006) were retrieved from theoretical reviews and integrations and through computer searches using PsychINFO. Recent issues of psychology, communication, economic, and organizational behavior journals were hand-searched for additional articles. In addition, we contacted experts in this area of research to send relevant, yet unpublished, work. Finally, we examined proceedings of the Academy of Management Conference and the International Association for Conflict Management to allow for the systematic inclusion of unpublished work.

Criteria for Inclusion

After collection, the studies were individually examined and included if they met the following criteria: they had to report a test of the relation between comparisons between communication cues and at least one dependent variable of interest. Table 1 presents an

overview of the different studies included in each meta-analysis, and their key attributes. As can be seen in columns FTF (face-to-face), SYN (synchronicity), VOC (vocal), VIS (visual), different studies allowed us to compare the impact of different cues.

Some studies made it possible to unravel the impact of face-to-face interaction (FTF=1). For example, the impact of face-to-face negotiations was compared with a setting where negotiators were (or believed they were) geographically dispersed (e.g. computer chats, email, audio, webcam) (e.g. Arunachalam & Dilla, 1992). Comparisons were coded by categorizing them as face-to-face vs. non face-to-face (e.g. face-to-face vs. chat or email). Yet, other studies allowed us to examine the influence of synchronicity (SYN=1) because they compared synchronous media (e.g. computer chat) with asynchronous media (e.g. email) (e.g. Loewenstein et al., 2005). We coded medium comparisons by categorizing them as synchronous vs. asynchronous (e.g. instant messaging vs. email). It was also possible to disentangle the impact of vocal and visual cues. In some studies for example, the impact of vocal-only negotiations (VOC=1) was compared with computer chat negotiations (e.g. Suh, 1999). Other studies examining the differences between webcam and phone allowed us to test the impact of visual cues on negotiations (VIS=1) (e.g. Purdy et al., 2000). We coded whether medium comparisons allowed us to test the effect of vocal vs. no vocal (e.g. phone vs. instant messaging) or visual vs. no visual (e.g. webcam vs. phone).

Measures of negotiation outcomes were reported in 30 papers. Because some of these were multi-study papers or allowed for multiple comparisons (e.g. synchronous vs. asynchronous and visual vs. no visual), we could extract a total of 68 effect sizes. Because different studies reported more than one outcome variable, we decided to focus our analyses on the two most important indicators of mutually beneficial outcomes; joint profit and settlement.

To explore the potential processes that underlie the effects of communication cues on negotiation outcomes, we included two additional measures; cooperation and information sharing. Cooperation was reported in 22 papers with 44 effect sizes, and was measured by the display of affect between negotiators such as the amount of cooperative acts. Twelve papers reported measures of information sharing, generating 19 effect sizes, and was measured by the amount of information exchange such as the volume of communication. We used techniques outlined by Hunter and Schmidt (1990) to combine dependent effects to a single effect size estimate for each dependent variable when necessary to avoid violating the assumption of independence (e.g. when a study included a measure of both settlement and mutual outcome).

Coding Scheme and Analysis

Table 2 provides an overview of each category in our coding scheme and a description of both moderators. Two raters assessed all the studies, conducted the coding for each individual study, and determined how the moderator was handled. The moderator “Experience with counterpart” was coded as (1) negative when the study manipulated a negative relationship between negotiators, distrust, or individualistic value intentions (e.g. King & Glidewell, 1980), or (2), neutral, when no mention was made of any relationship, trust or social value orientation manipulation, or (3), positive, when the study manipulated a positive relationship, trust or prosocial value orientations (e.g. McGinn & Keros, 2002). Because the year 2000 has been recognized a tipping point for the adoption of new technology, (PEW/Internet, 2006; Sabia, 2005) we coded the moderator “Experience with technology” by splitting the data in a pre-internet low experience category (1 = publication year before 2000) and post-internet high experience category (2 = publication year equal or after 2000).¹

We further controlled for the sample type (1 = undergraduates, 2 = postgraduate or professionals), publication status (1 = published, 2 = unpublished), and whether or not time in the experiment was restricted (1 = restricted and less than an hour, 2 = unrestricted). To resolve any residual disagreements, coders went back to the research report together and reached consensus on the appropriate coding. Since all the studies except one (Loewenstein & Morris, under review) involved negotiations in which agreement was better than no agreement (i.e. negotiations with a positive bargaining zone), we did not control for the type of negotiation.

Because our primary interest was on how cues affected mutually beneficial outcomes, we used the group (dyad) as the level of analysis. Because of the relatively large number of empirical studies investigating these relationships, and because of the likely existence of variables moderating the strength of association, we used a meta-analytic approach to integrate the results (Cooper & Hedges, 1994). In meta-analyses the effects of the independent variable on the dependent variables are typically reported in the form of an F or a t statistic, in the form of average treatment effects (means and standard deviations), or in the form of assessments of covariation. All these can be converted into an effect size index which measures the magnitude of an effect—in this case, the magnitude of difference between the certain communication cues. In the case of this meta-analysis, we chose the correlation coefficient r as our measure of effect size, primarily because of its ready interpretability (Rosenthal, 1984). We coded effect sizes so that as r (ranging from -1 to 1) gets larger, the effect that a certain medium characteristic has on one of the three dependent variables gets larger. Tests of the hypotheses were conducted using conventional meta-analytic procedures in a fixed-effects model (Cooper & Hedges, 1994).

Results

The number of effect sizes was sufficient in all meta-analyses to make meaningful comparisons. For effects of moderators within each meta-analysis, we only reported average weighted effect sizes when categories contained at least three different effect sizes. Due to the number of effect sizes in each meta-analysis, we could not test all moderators in all four meta-analyses (see Table 3). We only report control variables for analyses of the outcome.

Face to Face communication

Negotiation outcome. The overall impact of face-to-face interaction on negotiation outcomes was positive ($r_w = .07, Z = 3.16, p < .01$). Importantly, we found support for Hypothesis 1 such that the impact of face-to-face interaction on outcomes was contingent on the experience with the counterpart, $Q_b, \chi^2 (2) = 9.97, p < .01$. As predicted, there was no advantage of face-to-face interaction when the previous experience with the counterpart was positive, $r_w = .03, Z = .41, ns$. However, face-to-face interaction had a positive and significant impact when there was no experience with the counterpart, $r_w = .09, Z = 3.71, p < .001$. When the experience with the counterpart was negative, face-to-face interaction decreased the negotiation outcome, $r_w = -.31, Z = -2.46, p < .05$.

Hypothesis 2 was also supported: face-to-face interaction had a stronger impact on those with less technology experience ($r_w = .13, Z = 3.87, p < .001$) than on those with more technology experience ($r_w = .02, Z = .63, ns$), $Q_b, \chi^2 (1) = 5.34, p < .05$.

The impact of face-to-face interaction on negotiation outcomes was not affected by the type of sample, *ns*. However, face-to-face interaction had a stronger impact in published studies ($r_w = .10, Z = 3.81, p < .001$) than in unpublished studies ($r_w = .00, Z = -.01, ns$), $Q_b, \chi^2 (1) = 4.54, p < .05$. In addition, face-to-face interaction had a somewhat

weaker impact in studies that restricted time ($r_w = .03$, $Z = 1.12$, *ns*) compared to those that did not ($r_w = .12$, $Z = 3.37$, $p < .001$), $Q_b, \chi^2(1) = 3.61$, $p = .06$.

Negotiation process. Face-to-face interaction had an overall positive impact on *cooperation* ($r_w = .15$, $Z = 4.93$, $p < .001$) but its impact was not contingent on the experience with the counterpart, $Q_b, \chi^2(1) = 4.25$, $p = .12$. However, the impact of face-to-face interaction on cooperation was weaker for less experienced negotiators ($r_w = .01$, $Z = .26$, *ns*) than for more experienced negotiators ($r_w = .23$, $Z = 6.04$, $p < .001$), $Q_b, \chi^2(1) = 12.28$, $p < .001$. The overall impact of face-to-face interaction on *information sharing* was positive ($r_w = .17$, $Z = 2.94$, $p < .01$). In addition, it was weaker for those with less technology experience ($r_w = .06$, $Z = 1.02$, *ns*) and stronger for those with more technology experience ($r_w = .69$, $Z = 4.90$, $p < .001$), $Q_b, \chi^2(1) = 16.39$, $p < .001$.

Synchronicity

Negotiation outcome. Importantly, while the overall impact of synchronous communication on negotiation outcomes was absent ($r_w = .02$, $Z = .62$, *ns*), Hypothesis 2 was supported. The impact of synchronicity was contingent on the technology experience such that synchronous communication had a stronger impact on those with less technology experience ($r_w = .23$, $Z = 2.21$, $p < .05$) than on those with more technology experience ($r_w = -.01$, $Z = -.22$, *ns*), $Q_b, \chi^2(1) = 4.54$, $p < .05$.

The impact of synchronous communication did not differ for the type of sample or publication status (p 's $> .49$). Time restriction had a small effect: outcome effects of synchronicity were positive when time was restricted ($r_w = .11$, $Z = 1.78$, $p = .07$) but equaled zero when this was not the case ($r_w = .00$, $Z = -.06$, *ns*), $Q_b, \chi^2(1) = 1.72$, $p = .17$.

Negotiation process. The overall impact of synchronous communication on *cooperation* was positive ($r_w = .23, Z = 5.47, p < .001$). The overall impact of synchronous communication on *information sharing* was also positive ($r_w = .24, Z = 3.47, p < .001$). No interactions could be tested.

Vocal Cues

Negotiation outcome. The overall impact of vocal cues on negotiation outcomes was positive and significant ($r_w = .15, Z = 2.28, p < .05$). Hypothesis 2 was partly supported: although vocal cues had a positive and significant impact on those with less experience ($r_w = .25, Z = 2.52, p < .05$) and not on those with more experience ($r_w = .07, Z = .74, ns$), this difference was not significant, $Q_b, \chi^2(1) = 1.72, p = .19$.

The impact of vocal cues did not differ between sample types or for time restriction (p 's $> .60$). The impact of publication status could not be tested.

Negotiation process. The overall impact of vocal cues on *cooperation* was positive ($r_w = .21, Z = 4.26, p < .001$) and was (marginally) weaker for those with less technology experience ($r_w = .12, Z = 1.61, p = .11$) than for those with more technology experience ($r_w = .30, Z = 4.34, p < .001$), $Q_b, \chi^2(1) = 3.23, p = .07$. The overall impact of vocal cues on *information sharing* was positive ($r_w = .31, Z = 4.42, p < .001$). No interactions could be tested.

Visual Cues

Negotiation outcome. Due to the low number of effect sizes, the impact of technology experience or control variables could not be tested. Nevertheless, visual cues contributed positively and significantly to the outcome, $r_w = .17, Z = 2.27, p < .05$.

Negotiation process. The overall impact of visual cues on *cooperation* was positive ($r_w = .17$, $Z = 3.28$, $p = .001$), and was not contingent on experience with the technology, $Q_b, \chi^2(1) = 1.16$, *ns*. The overall impact of visual cues on *information sharing* was small and non-significant ($r_w = .03$, $Z = .45$, *ns*).

Discussion

Findings

Although the idea that the presence of communication cues enables negotiators to get better outcomes is an assumption that makes intuitive sense, empirical evidence has been far from supportive. The results of our meta-analyses demonstrate how these mixed effects are explained by examining the context in which certain communication cues are used. In particular, we demonstrate that negotiators' experience with the counterpart as well as with the technology shape the effects that communication cues may have.

Support was found for the prediction that a positive experience with the counterpart reduces the impact of face-to-face interaction on negotiation outcomes. However, when these experiences were absent, face-to-face interaction significantly improves mutually beneficial outcomes. Moreover, when experiences with the counterpart were negative, face-to-face interaction deteriorated outcomes, suggesting that conflict escalated. In addition, the results shed some light on the underlying process: when experiences with the counterpart are positive, negotiators are more likely to cooperate, and the presence of face-to-face interaction does not add to this effect. However, when experiences with the counterpart are absent, face-to-face interaction may provide the means to promote cooperative intentions. The data further suggest that face-

to-face may decrease cooperation when negotiators are negatively related to each other. Unfortunately, we could not examine how information sharing related to these findings.

We also found support for the prediction that the mixed effects of communication cues on negotiation outcomes can be explained by varying levels of (assumed) experience with the technology. Although moderation effects were strongest for synchronicity, the results reveal support for the idea that the presence of face-to-face interaction, synchronicity, or vocal cues contributes to the achievement of mutually beneficial outcomes more so for less experienced- and less so for more technology experienced negotiators. Analyses of the processes underlying this effect suggest that more experience allows one to be cooperative regardless of the type of communication cue(s) present.

Finally, we found that the impact of cues on outcomes did not differ for studies conducted with undergraduate students or MBA's and professionals. In terms of publication status, we found that the impact of face-to-face interaction was stronger for published studies than for unpublished studies, which points to the possibility of a bias towards publishing significant results. The impact of face-to-face interaction was stronger in studies that did not restrict time, suggesting that face time may be important in long term collaborations (see also Maznevski & Chudoba, 2000). In addition, the impact of synchronicity was weaker in studies not restricting time, suggesting that the downside of asynchronous communication can be overcome when negotiators are given enough time.

Implications

Our results show that the effects that communication cues have on negotiations can only be understood in conjunction with the context within which they are used. This finding is consistent with recent CMC research (Carlson & Zmud, 1994; DeSanctis &

Poole, 1994; Kiesler & Kraut, 1999; Postmes et al., 1998; Walther, 1996) but has not been recognized in the context of negotiations. Moreover, our findings have important societal and organizational consequences because non face-to-face negotiations have the potential to save environmental-, health-, and financial costs associated with traveling.

Our results also provide advice on how to manage communication settings in negotiations. First, negotiations should strive to enrich the context by getting positively acquainted, for example by first engaging in small talk. However, when a negative relationship exists, negotiators may be better off restricting their contact and communicate through a third party first (see also Goldberg, 2005; Swaab & Brett, 2007). Second, managers should become familiar with the technology before using it. Although negotiators do not have to master the ins and outs of all possible communication media, they should become comfortable expressing themselves on behalf of the presence and absence of different communication cues (Swaab & Galinsky, 2007).

Conclusion

By embracing different theoretical approaches stemming from Communication Science, Psychology, Organizational Behavior, Economics, and Information Systems, the mixed evidence which marred the literature on the impact of communication cues on negotiation thus far was explained. Moreover, straightforward advice was provided about how negotiators should utilize communication settings in negotiations. Most importantly, despite the sometimes understandable skepticism about the utility of technologies to negotiations, the study of communication media (and the cues they contain) increasingly proves that negotiations benefit considerably when one carefully considers the context and the cues with which to communicate, instead of relying on assumptions and a priori beliefs alone.

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Table 1.

Study Characteristics and Effect Sizes

		Effect size (<i>r</i>)			Ngr	Comparison	Meta-analyses				Moderators			Controls	
		Dependent variable					FTF	SYN	VOC	VIS	EC	ET	SA	PS	TR
		OUT	COO	INF											
Arunchalam & Dilla	1992	.23			60	ftf-sync text	1	0	0	0	2	1	1	1	1
Arunchalam & Dilla	1995	.25			60	ftf-sync text	1	0	0	0	2	1		1	1
Barsness & Tenbrunsel	1998	.15	.21	.32	96	ftf-async text	1	0	0	0	2	1	1	2	1
Carnevale & Isen	1986	-.86	-.84	-.65	20	ftf-audio	1	0	0	0	2	1	1	1	1
Carnevale & Isen	1986	.11	.40	.55	20	ftf-audio	1	0	0	0	3	1	1	1	1
Carnevale et al	1981	.00	-.33	-.26	66	ftf-audio	1	0	0	0	2	1	1	1	1
Citera	2005	-.27	.05		70	ftf-sync text	1	0	0	0	2	2	1	1	2
Croson	1999	.15			77	ftf-async text	1	0	0	0	2	1	2	1	2
Crott et al	1980		.22		78	audio-async text	0	1	1	0	2	1	1	1	1
Drolet & Morris (1)	2000	.31			67	ftf-async text	1	0	0	0	2	2	2	1	2
Drolet & Morris (2)	2000	.43	.55		21	ftf-audio	1	0	0	0	2	2		1	2
Fry	1985	.36			24	ftf-audio	1	0	0	0	1	1	1	1	2
Fry	1985	-.61			24	ftf-audio	1	0	0	0	2	1	1	1	2
Fry	1985	.15			24	ftf-audio	1	0	0	0	3	1	1	1	2
Griffith & Northcraft	1994	.42			22	sync -async text	0	1	0	0	2	1	1	1	1
Griffith & Northcraft	1994	-.01			22	sync -async text	0	1	0	0	3	1	1	1	1
Harmon	1998		-.30		50	ftf-audio	1	0	0	0	2	1	1	1	2
Hollingshead et al (1)	1993	.57			20	ftf-async text	1	0	0	0	2	1	1	1	2
Hollingshead et al (2)	1993	.00			20	ftf-async text	1	0	0	0	2	1	1	1	2
Jain & Salomon	2000		.19	.14	10	ftf-sync text	1	0	0	0	1	2	1	1	
Jain & Salomon	2000		.27	.44	17	ftf-sync text	1	0	0	0	3	2	1	1	
King & Glidewell	1980	-.83			12	ftf-audio	1	0	0	0	1	1	2	1	2
King & Glidewell	1980	-.85			12	ftf-async text	1	0	0	0	1	1	2	1	2
King & Glidewell	1980	.05			12	audio-async text	0	1	1	0	1	1	2	1	2
King & Glidewell	1980	.50			12	ftf-audio	1	0	0	0	2	1	2	1	2
King & Glidewell	1980	.69			12	ftf-async text	1	0	0	0	2	1	2	1	2
King & Glidewell	1980	.12			12	audio-async text	0	1	1	0	2	1	2	1	2
Lewis & Fry	1977	-.59	-.40		23	ftf-audio	1	0	0	0	1	1	1	1	1
Lewis & Fry	1977	.02	.00		23	ftf-audio	1	0	0	0	3	1	1	1	1
Lim	2000	.31			32	ftf-async text	1	0	0	0	2	2	1	1	
Loewenstein	2005	.06	.15	-.09	112	sync-async text	0	1	0	0	2	2	2	1	2
Loewenstein & Morris (1)	2007	.11	.21		100	ftf-sync text	1	0	0	0	2	2	2	2	2
Loewenstein & Morris (1)	2007	.20	.42		99	ftf-async text	1	0	0	0	2	2	2	2	2
Loewenstein & Morris (1)	2007	.09	.25		107	sync-async text	0	1	0	0	2	2	2	2	2
Loewenstein & Morris (2)	2007	-.23	.25		83	sync-async text	0	1	0	0	2	2	2	2	2

Note. OUT = Outcome efficiency, COO = Cooperation, INF = Information sharing, Ngr = Number of groups examined for comparison, FTF = Face-to-face contact, SYN = Synchronicity, VOC = Vocal cues, VIS = Visual cues, EC = Experience counterpart, ET = Experience technology, SA = Sample, PS = Publication status, TR = Time restriction

Table 1 (continued).
Study Characteristics and Effect Sizes

		Effect size (<i>r</i>)														
		Dependent variable				Ngr	Comparison	Meta-analyses				Moderators			Controls	
		OUT	COO	INF				FTF	SYN	VOC	VIS	EC	ET	SA	PS	TR
McGinn & Keros	2002	.11			30	ftf-audio	1	0	0	0	2	2	1	1	1	
McGinn & Keros	2002	.10			28	ftf-async text	1	0	0	0	2	2	1	1	1	
McGinn & Keros	2002	.01			28	audio-async text	0	1	1	0	2	2	1	1	1	
McGinn & Keros	2002	.05			30	ftf-audio	1	0	0	0	3	2	1	1	1	
McGinn & Keros	2002	.02			28	ftf-async text	1	0	0	0	3	2	1	1	1	
McGinn & Keros	2002	.03			28	audio-async text	0	1	1	0	3	2	1	1	1	
Morris et al	2002	.19		.85	39	ftf-async text	1	0	0	0	2	2	2	1	2	
Naquin & Paulson	2003	.03	.89		67	ftf-async text	1	0	0	0	2	2	2	1	1	
Pesendorfer & Koeszegi	2006	-.12	.27	.62	50	sync-async text	0	1	0	0	2	2	1	1	.	
Purdy et al	2000	-.10	.32		37	ftf-video	1	0	0	0	2	2	2	1	2	
Purdy et al	2000	.03	.30		42	ftf-audio	1	0	0	0	2	2	2	1	2	
Purdy et al	2000	.08	.31		38	ftf-sync text	1	0	0	0	2	2	2	1	2	
Purdy et al	2000	.16	.00		37	video-audio	0	0	0	1	2	2	2	1	2	
Purdy et al	2000	.16	.00		33	video-sync text	0	0	1	1	2	2	2	1	2	
Purdy et al	2000	.07	.00		38	audio-sync text	0	0	1	0	2	2	2	1	2	
Rangaswamy & Shell	1997	.22			67	ftf-async text	1	0	0	0	2	1	2	1	2	
Rhee	1995	.00	.06		20	ftf-sync text	1	0	0	0	2	1	1	1	2	
Schulz & Pruitt	1978	.00			31	ftf-pen/paper	1	0	0	0	1	1	1	1	1	
Schulz & Pruitt	1978	.00			31	ftf-pen/paper	1	0	0	0	3	1	1	1	1	
Schweitzer	2002		.38		70	video-audio	0	0	0	1	2	2	2	1	1	
Sheffield	1995	.26	.09	.81	50	audio-sync text	0	0	1	0	2	1	1	1	1	
Sheffield	1995	.18	.07	.13	50	visual -no visual	0	0	0	1	2	1	1	1	1	
Short	1974	.04			32	ftf-video	1	0	0	0	2	1	2	1	1	
Short	1974	.05			32	ftf-audio	1	0	0	0	2	1	2	1	1	
Short	1974	.01			32	video-audio	0	0	0	1	2	1	2	1	1	
Smith	1969	.31			60	ftf-async text	1	0	0	0	2	1	1	1	2	
Stephenson et al	1976		.43	.44	24	ftf-audio	1	0	0	0	2	1	1	1	1	
Suh	1999		.10		39	video-audio	0	0	0	1	2	1	1	1	2	
Suh	1999		-.03		39	audio-sync text	0	0	1	0	2	1	1	1	2	
Suh	1999		.08		38	video-sync text	0	0	1	1	2	1	1	1	2	
Suh	1999		.10		39	ftf-video	1	0	0	0	2	1	1	1	2	
Suh	1999		.18		40	ftf-audio	1	0	0	0	2	1	1	1	2	
Suh	1999		.16		39	ftf-sync text	1	0	0	0	2	1	1	1	2	
Swaab et al	2007	.36			28	ftf-sync text	1	0	0	0	2	2	2	2	1	
Swaab et al	2007	.00			28	ftf-sync text	1	0	0	0	3	2	2	2	1	

Note. OUT = Outcome efficiency, COO = Cooperation, INF = Information sharing, Ngr = Number of groups examined for comparison, FTF = Face-to-face contact, SYN = Synchronicity, VOC = Vocal cues, VIS = Visual cues, EC = Experience counterpart, ET = Experience technology, SA = Sample, PS = Publication status, TR = Time restriction

Table 1 (continued)
Study Characteristics and Effect Sizes

		Effect size (<i>r</i>)			Ngr	Comparison	Meta-analyses				Moderators			Controls	
		Dependent variable					FTF	SYN	VOC	VIS	EC	ET	SA	ST	TR
		OUT	COO	INF											
Turnbull et al	1976	.00			44	ftf-video	1	0	0	0	2	1	1	1	1
Turnbull et al	1976	.29			44	ftf-audio	1	0	0	0	2	1	1	1	1
Turnbull et al	1976	.29			44	video-audio	0	0	0	1	2	1	1	1	1
Tysoe	1984		.57	.40	12	ftf-audio	1	0	0	0	2	1	1	1	1
Valley et al (1)	1998	.36			83	ftf-async text	1	0	0	0	2	1	2	1	1
Valley et al (2)	1998	.02			42	ftf-audio	1	0	0	0	2	1	1	1	1
Valley et al (2)	1998	.30			48	ftf-pen/paper	1	0	0	0	2	1	1	1	1
Valley et al (2)	1998	.29			48	audio-pen/paper	0	1	1	0	2	1	1	1	1
Wichman	1970		.26		22	ftf-audio	1	0	0	0	2	1	1	1	
Williams	1975			-.10	30	ftf-video	1	0	0	0	2	1	2	1	1
Williams	1975			-.18	30	ftf-audio	1	0	0	0	2	1	2	1	1
Williams	1975			.00	30	video-audio	0	0	0	1	2	1	2	1	1
Yang	2003	-.22	.23		146	ftf-sync text	1	0	0	0	2	2	2	2	1
Yang	2003	-.16	-.01		134	ftf-async text	1	0	0	0	2	2	2	2	1
Yang	2003	.06	.20		128	sync-async text	0	1	0	0	2	2	2	2	1
Yuan et al	2003		-.01	-.11	40	video-audio	0	0	0	1	2	2	2	1	1
Yuan et al	2003		.42	.20	40	audio-sync text	0	0	1	0	2	2	2	1	1
Yuan et al	2003		.42	.12	40	video-sync text	0	0	1	1	2	2	2	1	1

Note. OUT = Outcome efficiency, COO = Cooperation, INF = Information sharing, Ngr = Number of groups examined for comparison, FTF = Face-to-face contact, SYN = Synchronicity, VOC = Vocal cues, VIS = Visual cues, EC = Experience counterpart, ET = Experience technology, SA = Sample, PS = Publication status, TR = Time restriction

Table 2.

Moderator variables

Comparisons		Categories / Scale		
FTF	Face-to-face vs.	0	no	Is face-to-face interaction compared with non face-to-face interaction?
	non face-to-face	1	yes	
SYN	Synchronous vs.	0	no	If communication is geographically dispersed, do media differ in terms of synchronicity?
	asynchronous	1	yes	
VOC	Vocal cues vs. no	0	no	If communication is geographically dispersed, do media differ in terms of the vocal cues provided?
	vocal cues	1	yes	
VIS	Visual cues vs. no	0	no	If communication is geographically dispersed, do media differ in terms of the visual cues provided?
	visual cues	1	yes	
Moderators				
EC	Experience counterpart	1	Present and negative	Could a relationship between negotiators be assumed and if so, what was the nature?
		2	Absent and neutral	
		3	Present and positive	
ET	Experience technology	1	Low experience	Study was conducted before year 2000
		2	High experience	Study was conducted in 2000 or later
Controls				
SA	Sample	1	Undergraduates	
		2	Postgraduate and professionals	
PS	Publication status	1	Published	
		2	Unpublished	
TR	Time restriction	1	Restricted (≤ 60 minutes)	
		2	Unrestricted	

Table 3.
Categorical moderators of the impact of face-to-face interaction, synchronicity, and vocal cues on mutually beneficial outcomes in negotiations

	Central tendency							Tests of homogeneity	
	r_w	95% C.I.		K	N_{gr}	N_{ind}	Z	Q_b	Q_w
								Between	Within
Face-to-face interaction	.07	.03	.12	49	2203	4755	3.16**		93.99***
Experience other								9.97**	
Present negative	-.31	-.55	-.06	5	102	228	-2.46*		10.98*
Absent neutral	.09	.04	.14	37	1917	4107	3.71***		82.76***
Present positive	.03	-.13	.20	7	184	420	.41		.25
Experience technology								5.34*	
Low	.13	.06	.19	30	1139	2570	3.87***		61.56***
High	.02	-.04	.08	19	1064	2185	.63		37.07***
Synchronicity	.02	-.05	.10	12	652	1304	.62		9.17
Experience technology								4.54*	
Low	.23	.03	.44	5	116	232	2.21*		2.04
High	-.01	-.09	.07	7	536	1072	-.22		7.13
Vocal cues	.15	.02	.29	8	249	498	2.28*		.83
Experience technology								1.72	
Low	.25	.06	.44	4	122	244	2.52*		.47
High	.07	-.12	.25	4	127	254	.74		.36

Note. r_w = weighted effect size, K = number of studies, N_{gr} = number of groups within studies, N_{ind} = number of individuals within studies, ‡ < .10, * < .05, ** < .01, *** < .001

Endnotes

¹ We also analyzed the moderating impact of experience with the technology using the year of publication as a continuous variable. These results effectively mirrored the results of the dichotomous analyses. Nevertheless, we felt the dichotomous operationalization to be more appropriate given the wide recognition of the year 2000 as a tipping point for internet adoption.

² References marked with an asterisk indicate studies included in the meta-analyses.