Communication Media and Negotiation Meta-Analysis:

Meta-Analyzing Effects on Outcomes, Information Sharing, and Relationships

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Abstract

The goal of this paper is to systematically examine the consequences of communication media on negotiations. Based on previous insights and conflicting prior research, an integrated approach is introduced to study the effects of different communication media on negotiations. The joint impact of time-place models, capacity approaches, and contextual perspectives guide three meta-analyses on negotiation outcomes, information sharing, and relationship establishment. Results suggest that synchronicity, co-location, and audio- and visual cues have positive effects on collective negotiation outcomes, information sharing, and the establishment of relationships in negotiations. In addition, results show that these effects are moderated by the number of parties involved and the number of negotiation issues. Importantly, the research illustrates that the use of communication media in negotiations deserves thoughtful selection. Instead of relying on the most convenient or easily accessible medium (i.e. email), one should pay careful attention to communication media characteristics, the goal of the negotiation, the number of parties involved, and the issues on the table. A failure to do so may result in deteriorated outcomes and serious process losses. Implications and opportunities for theory development and negotiators are discussed.

KEY WORDS: Communication Media, Negotiation, Meta-Analysis, Computer Mediated Negotiation, Outcomes, Information Sharing, Relationship Establishment

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Managers today increasingly rely on a wide variety of communication media for negotiation and decision making. Given the prominence of these various alternatives, it is critical to understand the effects of different media channels on communication. Often, managers rely on intuition or the most easily accessible medium without being aware of potential disadvantages that certain media may bring. Researchers have also become increasingly concerned with communication media, especially with how they affect negotiations and decision making processes (Thompson & Nadler, 2002). Despite this increased attention, research to date has failed to provide consistent practical implications: whereas some studies reveal strong differences between communication media in terms of the extent to which collective outcomes were established (Kern, Medvec, Diermeier & Swaab, 2004; Mennecke, Valacich & Wheeler, 2000), other studies reported little or no differences (Croson, 1999; Fry, 1985). We argue that part of the reason for these ostensibly conflicting results is that an integration of the literature has yet to be published. Although comparisons have been made between face-to-face and electronic negotiations (Stuhlmacher & Citera, 2005), not much is known about how fundamental characteristics of communication impact negotiations. Research on communication media effects in negotiations has been growing rapidly and has accumulated to a point where it is necessary to synthesize its effects in order to obtain insight into when and why certain are to be expected.

The paper will accomplish this in three ways. First, we chart the effects of communication media across a broad range of studies to obtain insight into the empirical

findings of this budding literature. Second, we synthesize these findings with regard to the effects that communication media have on collective negotiation outcomes, information sharing, and relationship establishment in negotiations to provide a theoretical overview of this literature. The challenge is to reconnect different strands of literature that compartmentalize the way we think about using communication media in negotiations. Third, by systematizing the effects communication media have in negotiations we will provide managers and practitioners with a rationale for the strategic use and selection of communication media. Our research is of substantial importance to both academic and business communities because it provides an integration of media effects on strategic interactions, an overview of implications that has been absent thus far.

In the remainder of this paper, we will first describe the type of negotiation outcomes and processes central to the present investigation. Then, we provide a brief background about how the effects of communication media on decision making and negotiations have been studied. In doing so, we distinguish between three approaches that have dominated the literature on computer mediated communication thus far, and describe their implications for the study of negotiations. An integrated framework of these three approaches lays the foundation for the meta-analyses.

Outcomes, Information, and Relations

In our analysis of the literature, we will focus on how communication media influence three typical negotiation variables. First of all, we examine media effects on collective negotiation outcomes. In this paper, we are concerned with the outcomes the parties attain in terms of impasse rates, total time to an agreement, and whether or not money is left on the table. Although these outcomes may differ in their specific nature,

the common binding factor is that they all affect the negotiation group or dyad as a whole. That is, in most cases, all parties benefit from fewer impasse rates, shorter negotiation time, and the utilization of all available resources, especially when the bargaining zone between negotiators is positive and no deal implies a loss of valuable resources.

In addition to negotiation outcomes, we distinguish between two types of process variables that are of crucial importance to negotiations: information sharing and relationship establishment. The first, *information sharing,* is critical to negotiations and indicative of whether or not negotiations are likely to succeed (De Dreu & Carnevale, 2003; Pinkley, 1995). Research shows that a higher flow of information exchange may lead to a more accurate understanding of one's own and others' interests as well as to outcomes that benefit oneself and the other party (Polzer, 1996; Thompson, 1991).

The second process variable we focus on is socio-emotional in nature and deals with how negotiators' relationships are affected by communication media. *Relationship establishment* refers to whether negotiators trust one another (Kimmel, Pruitt, Magenau, Konar-Goldband & Carnevale, 1980), feel interpersonally attracted (Loewenstein, Thompson & Bazerman, 1989), or act in the interests of a shared, superordinate identity (Kramer, Pommerenke & Newton, 1993). Positive relationships are instrumental in negotiations because they provide the "social glue" between parties in conflict (Murnighan, Babcock, Thompson & Pillutla, 1999; Valley, Thompson, Gibbons & Bazerman, 2002), which in turn allows individual negotiators to establish outcomes that benefit themselves as well as others.

Several approaches have dominated the literature thus far in studying the effects of communication media on these three negotiation variables[1]. First, media effects are often described according to time place models of social interaction. A key assumption underlying this model is the idea that human behavior is largely determined by the extent to which people are able to provide direct feedback to one another and whether or not they are geographically dispersed during their communication. A second stream of research, so-called capacity approaches, has focused on how the available cues within a communication medium determine interaction processes and outcomes. These approaches typically argue that more complex messages can only be communicated effectively when the medium has multiple cues available. Third and partly developed as a theoretical critique on these two medium-driven approaches, contextual models emphasize the importance of situational factors affecting the relationship between communication media on the one hand and interaction processes and outcomes on the other. Rather than ascribing effects on processes and outcomes to media alone, these approaches argue that media effects depend on an interaction between characteristics of communication media *as well as* socio-contextual factors related to aspects of the task or the negotiators.

Next, we explain the implications of all three approaches (and their combinations) for negotiation outcomes, information sharing, and relationship establishment in more detail. In doing so, we focus especially on their implications for the field of negotiations rather than providing an extensive and detailed review of the communication media literature as a whole.

Time-Place Model

A commonly accepted way to think about media effects involves *time-place models*. This typology categorizes media in two distinct dimensions; synchronicity and place of communication. Synchronous communication – which allows people to respond directly to others - may take place either when people are located in the same place (e.g. face-to-face) or when they are geographically dispersed (e.g. telephone or computer mediated communication such as instant messaging). In a similar vein, asynchronous communication – in which it is not possible to give immediate feedback- may take place when people act in the same location (e.g. posting notes on a physical message board) or when working from different locations (e.g. email).

Although this typology focuses in principle on a categorization of media, it has important implications for the study of communication media effects. For example, it has been argued that differences in the extent to which communication is synchronous or co-located, has a significant impact on peoples' behavior and negotiation outcomes. Indeed, research has shown that synchronous communication may provide individuals with an opportunity to become more influential and develop a more accurate understanding of others' interests as compared to communication media that lack such synchronicity (Carlson & Zmud, 1999). In a similar vein, it has been demonstrated that co-located communication, which allows for the conveyance of nonverbal cues, mirrors "naturalistic" communication more closely. That is, it increases feelings of social presence (Short, Williams & Christie, 1976), and is preferable in terms of increased outcomes in various decision making tasks compared to settings where people are geographically dispersed (Baltes, Dickson, Sherman, Bauer & LaGanke, 2002).

Research has also suggested that dimensions of time and place may influence negotiation processes and outcomes (Thompson, 2001). However, research is far from consistent regarding the effects of both dimensions in negotiations. For example, some studies found synchronous negotiations (e.g. via instant messaging) to result in fewer impasses and more time efficiency than those via asynchronous media such as email (Yang, 2003), whereas others did not find such a difference (Pesendorfer & Koeszegi, 2005). Despite these differences, we argue that the overall benefits of synchronicity are twofold. First, synchronous communication allows for the "conveyance" of multiple cues (Dennis & Valacich, 1999; Dennis, Valacich, Speier & Morris, 1998), which means that negotiators have an opportunity to frame and shape the other side's reactions by directly responding to their actions and arguments, potentially contributing to more accurate message comprehension. In other words, synchronous communication allows negotiators to understand the flow of information being communicated more accurately, and provides them a possibility to anticipate whenever necessary. So, synchronous communication is likely to lead to more information exchange.

Synchronous communication may also foster "convergence" between negotiators (Dennis et al., 1998). That is, the immediacy of feedback provided by synchronicity allows negotiators to socially validate opinions and interests more easily and foster feelings of social presence. As a result, it may be easier for negotiators to establish rapport and discover commonalties with their counterparty than when communication is asynchronous. Thus, in addition to an informational benefit, synchronous communication may also increase the likelihood that stronger relationships are formed between negotiators compared to situations in which communication is asynchronous. Based on

these two predictions regarding medium synchronicity on the one hand and both process variables on the other, plus the fact that prior research found strong and positive links between higher collective outcomes and information exchange and relationship establishment (De Dreu, Weingart & Kwon, 2000; Thompson, 1990; Thompson, 1991), we expect that overall:

Hypothesis 1a: Synchronous negotiations lead to higher collective outcomes compared to asynchronous negotiations

Hypothesis 1b: Synchronous negotiations lead to more information sharing compared to asynchronous negotiations

Hypothesis 1c: Synchronous negotiations lead to better relationships between parties compared to asynchronous negotiations

We argue that compared to (geographically) dispersed settings, co-location has a somewhat similar impact on negotiations. It is important to note here that in examining the effects of co-location, we only focus on face-to-face versus other forms of (synchronous and asynchronous) communication since it is very unlikely that negotiations take place through an asynchronous message board. Past research on co-location in negotiation research has reported mixed evidence. That is, some research found strong differences between co-located and dispersed forms of communications such that co-location resulted in fewer impasses (Purdy, Nye & Balakrishnan, 2000), whereas other research did not show such a difference (Suh, 1999; Valley, Moag & Bazerman, 1998) [2]. Despite these differences, we argue that co-location has an overall benefit over those situations where participants are (or perceive to be) dispersed. Again, we argue that the underlying reasons are twofold. First, co-located communication allows

negotiators to anticipate more precisely what the other's actions will be. For example, nonverbal communication and tone of voice in face-to-face negotiations may strongly reveal other players' intentions and motives, providing information about when to respond and make a counteroffer (Thompson, 2001). Co-location thus has a clear informational benefit.

Second, research has also suggested that co-located negotiations are subject to stronger social pressures. For example, it has been found that public communication settings (both face-to-face and computer mediated) lead negotiators to adopt a do-no-harm principle (Baron, 1995) leading them to become more reluctant to exclude others (Kern et al., 2004). Thus, co-located negotiations have been shown to lead to fewer impasses or inefficient deals (i.e. more positive outcomes) than dispersed negotiations and lead to more information sharing as well as better relationships between the parties. Based on these predictions regarding co-location and process variables, and the strong and positive links between outcomes and information exchange and relationship establishment, we predict:

Hypothesis 1d: Co-located negotiations lead to higher collective outcomes compared to dispersed negotiations

Hypothesis 1e: Co-located negotiations lead to more information sharing compared to dispersed negotiations

Hypothesis 1f: Co-located negotiations lead to better relationships between parties compared to dispersed negotiations

Capacity Approaches

However, media may not only differ with respect to dimensions of time and place. Consider for example phone conferences versus instant messaging. Although both are synchronous and geographically dispersed, they differ in the extent to which audio and textual cues are available. Similarly, video mail and electronic mail are both asynchronous and dispersed but vary in the amount of visual cues being conveyed. So, next to a difference in dimensions of time and place, media may also vary in the extent to which audio and/or visual cues are present. The added value of such communication cues and their effects on feelings of social presence has been central to capacity approaches.

The capacity approach comprises several theories such as Social Presence Theory (Short et al., 1976), Information Richness Theory (Daft & Lengel, 1986), the Cuelessness Model (Rutter, 1987; Rutter & Stephenson, 1979) and the Reduced Social Cues Approach (Kiesler, Siegel & McGuire, 1984). Although there are qualitative differences in the primary foci of these theories, all argue –in one way or another- that a medium's capacity to convey multiple cues concurrently determines whether or not people are able to work in an effective manner with one another.

Capacity approaches also emphasize the importance of a fit between the media being used and the type of task people face (McGrath & Hollingshead, 1993). In other words, the task people work on should be matched with the amount of cues a medium has to "offer". For example, complex tasks such as board meetings will only be effective when they allow a multitude of social cues to be present (e.g. nonverbal communication, audio, text, etc.). In contrast, relatively simple tasks such as notifications of changes in schedules do not require all these extra cues and would benefit more from "leaner" media such as textual forms of communication (Daft & Lengel, 1986).

However, negotiation research has been equivocal about the added value of communication cues. For example, some studies have shown that compared to text-based communication, the presence of audio contributed to fewer impasses (Mennecke et al., 2000; Suh, 1999; Valley et al., 1998) whereas other research did not find these differences (King & Glidewell, 1980). In a similar vein, some work showed that the presence of visual cues resulted in higher outcomes (Drolet & Morris, 2000) whereas others again, did not (Carnevale, Pruitt & Seilheimer, 1981; Fry, 1985).

Irrespective of these different findings we argue that, overall, the presence of audio and visual cues positively correlates to one's ability to exert social influence, which makes the interaction inherently more dynamic. Both audio and visual cues have the potential to facilitate the flow of information and inform negotiators about the relational dimension (e.g. whether the other can be trusted or not). Thus, one may anticipate that the presence of these cues will lead to more information sharing and better relationships between the parties compared to when such cues are absent.

Hypothesis 2a: The presence of audio cues in negotiation leads to higher collective outcomes than when such cues are not present

Hypothesis 2b: The presence of audio cues in negotiation leads to more information sharing than when such cues are not present

Hypothesis 2c: The presence of audio cues in negotiation leads to better relationships between parties than when such cues are not present

Along similar lines, it can be expected that:

Hypothesis 2d: The presence of visual cues in negotiation leads to higher collective outcomes than when such cues are not present

Hypothesis 2e: The presence of visual cues in negotiation leads to more information sharing than when such cues are not present

Hypothesis 2f: The presence of visual cues in negotiation leads to better relationships between parties than when such cues are not present

Contextual Approaches

Although research inspired by capacity ideas suggested an overall pattern that negotiations benefit from the presence of audio and visual cues, attempts to generalize these findings to other decision making tasks have been equivocal (Daft, Lengel & Trevino, 1987; El-Shinnawy & Markus, 1992; Kinney & Watson, 1992). Moreover, it can be argued that these theories are outdated since they draw too heavily on "older" technologies and do not account for the impact of "newer" technologies such as email or instant messaging. A more fundamental critique is that medium capacity approaches are too narrowly-focused since they overly ignore the importance of contextual factors such as the amount of people involved during the communication (Tanis, 2003; Walther, Anderson & Park, 1994). On these grounds, contextual approaches argue that communication media effects should not be explained by characteristics of the medium alone, but also by a close examination of factors underlying the context in which the medium is used. We distinguish between two important contextual factors that past research has focused on thus far: the number of parties involved in the negotiation and the number of issues negotiated.

Number of parties. Negotiation research typically focuses on dyads, interactions between two individuals. Oftentimes, interactions take place between three or more individuals (multiparty), which are more complex and require more coordination than

interactions between dyads. Multiparty negotiations also allow for coalition formation between a subset of parties (Thompson, 2001). This, in turn, can undermine collective negotiation outcomes since coalitions often leave money and resources behind at the table, especially when communication is computer (Kern et al., 2004). It can be inferred from this that it is harder to increase collective outcomes in multiparty negotiations compared to dyadic negotiations. Multiparty negotiations are therefore more likely to benefit from factors that contribute to higher collective outcomes. Before, we argued that the presence of several communication characteristics (i.e. synchronicity, co-location, audio, and visual) contributes to higher negotiation outcomes. If we combine these two hypotheses, it can be expected that:

Moderation hypothesis 3a: The impact of synchronicity, co-location, audio, and visual cues on collective negotiation outcomes will be stronger in multiparty negotiations than in two-party negotiations

Because of the involvement of multiple communication actors, multiparty negotiations also require more information to be exchanged (Thompson, 2001). It can therefore be argued that, compared to dyadic negotiations, multiparty negotiations benefit more from factors enabling information sharing. Already, we have argued that the presence of communication characteristics may contribute to easier information sharing. It can therefore be expected that:

Moderation hypothesis 3b: The impact of synchronicity, co-location, audio, and visual cues on information sharing will be stronger in multiparty negotiations than in two-party negotiations

In addition to the above, it is also more difficult to develop sustainable relationships in multiparty negotiations than it is in dyadic ones. That is, as group size increases, the less likely one is to develop or maintain positive relations with all other members in the group on a personal basis. So, compared to dyadic negotiations, multiparty negotiations may benefit more from factors that contribute to the establishment of relationships between negotiators. Before, we argued that the presence of communication characteristics may fulfill such as function. As a result, it can be expected that:

Moderation hypothesis 3c: The impact of synchronicity, co-location, audio, and visual cues on relationship establishment will be stronger in multiparty negotiations than in two-party negotiations

Number of negotiation issues. Another moderator is the number of negotiation issues that need to be negotiated. A common distinction in negotiation research is between single-issue distributive and multi-issue integrative negotiations. Specifically, single-issue, distributive negotiations, in which one's profit typically implies another person's loss, are more competitive than multi-issue, integrative negotiations which are characterized by the ability to trade across differences in preferences. Because of their potential for conflict to escalate, single-issue distributive negotiations are more likely to result in deteriorated outcomes such as impasses compared to multi-issue integrative negotiations. Therefore, single-issue distributive negotiations may benefit more from factors that help to overcome such impoverished outcomes. Since the presence of communication characteristics may fulfill such a role, it can be expected that:

Moderation hypothesis 4a: The impact of synchronicity, co-location, audio, and visual cues on collective negotiation outcomes will be stronger in single-issue distributive negotiations than in multi-issue integrative negotiations

However, it can be argued that distributive negotiations are informationally less complex than integrative negotiations because there is potentially less to talk about (i.e. fewer issues). In other words, integrative negotiations require more information sharing and may therefore profit more so from factors that facilitate this compared to distributive negotiations. Again, and as hypothesized before, the presence of communication characteristics may fulfill this need. It can thus be expected that:

Moderation hypothesis 4b: The impact of synchronicity, co-location, audio, and visual cues on information exchange will be stronger in multi-issue integrative negotiations than in single-issue distributive negotiations

As mentioned before, single-issue distributive negotiations carry with them a greater potential for conflict to escalate and thereby a more challenging environment to establish positive relationships. That is, when there is only one issue at the table, interactions may be more contentious compared to when multiple issues are present. Single issue, distributive negotiations may therefore profit more from the presence of factors fostering relationship establishment between negotiators. Combined with earlier hypotheses stating that the presence of communication characteristics contributes to relationship establishment, it can be expected that:

Moderation hypothesis 4c: The impact of synchronicity, co-location, audio, and visual cues on relationship establishment will be stronger in single-issue distributive negotiations than in multi-issue integrative negotiations

Overall, it can be concluded that time-place models, capacity approaches, and contextual perspectives may all be useful and necessary in studying effects of communication media in negotiations. The question we are concerned with is what the effects of time-place models, capacity approaches and contextual approaches are on negotiations. More specifically, we use time-place models and capacity approaches to examine "between" media effects while considering the moderating impact of contextual factors as suggested by contextual approaches (see Figure 1).

Method

Literature Search

Standard literature search techniques were used to retrieve data on the relation between communication media as independent variables and negotiation outcomes and processes as dependent variables. Articles and doctoral dissertations (until March 2005) 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. Finally, we examined conference proceedings of the last three annual conferences of the Academy of Management, the International Communication Association, 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: studies had to report a test of the relation between comparisons between communication media and at least one dependent variable of interest. As mentioned, the meta-analysis is concerned with the effect of different communication media in negotiations. Table 1

presents an overview of the different studies included in each meta-analysis, and their key attributes. As can be seen in columns T (time), P (place), A (audio), V (visual), different aspects of (i) the time place model (synchronicity vs. asynchronicity and co-located vs. dispersed) and (ii) capacity approaches (audio vs. no audio and visual vs. no visual) were encountered in different studies. Some studies allowed us to examine the influence of media synchronicity (T) because they compared synchronous media (e.g. computer chat) with asynchronous media (e.g. email) (e.g. Loewenstein, Morris, Chakravarti, Thompson & Kopelman, 2005). Yet, other studies made it possible to unravel the influence of place dependence (P). 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). We coded medium comparisons as suggested by time place models by categorizing them as synchronous vs. asynchronous (e.g. instant messaging, audio, video, or face-to-face vs. email or pen and paper) and/or co-located vs. dispersed communication (e.g. face-to-face vs. phone conference, chat, or email).

Some studies also made it possible to disentangle the relative influence of elements of capacity approaches such as the influence of audio and visual cues. In some studies for example, the impact of audio-only negotiations (A) was compared with computer chat negotiations (e.g. Mennecke et al., 2000). Other studies where differences between webcam and computer chats were examined allowed us to test the impact of visual cues on negotiations (V) (e.g. Purdy et al., 2000). So, we coded whether medium comparisons allowed us to test the effect of audio vs. no audio (e.g. phone conference vs. email) or visual vs. no visual (e.g. face-to-face vs. email) using the communication medium main effect only. For example, when a

study manipulated both the presence of audio and gender composition, we would use the overall main effect for audio only and collapse gender effects.

Measures of collective negotiation outcomes were reported in 17 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 40 effect sizes. We extracted one measure of effect size per medium comparison per study. If multiple measures were available, we captured all and averaged them (as recommended by Hunter & Schmidt, 1990), so as to minimize problems of independence. Examples of collective negotiation outcome measures included impasse rates, the time negotiations took to finalize a deal, and whether or not money was left behind at the negotiation table. Important to note here is that our literature search only revealed single-issue distributive negotiations with a positive bargaining zone. Within such negotiations, no deal (e.g. an impasse) is considered inferior and unnecessary since parties can settle on a range of possible agreements that are higher than their reservation points. In other words, not reaching a deal in a single-issue negotiation with a positive bargaining zone is suboptimal because negotiators are worse off not reaching agreement than reaching agreement (Thompson, 2001). Because we are interested in how communication media affect negotiation performance in general, and since not reaching a deal is also considered to be inferior in multi-issue integrative negotiations, comparing effects of both types of negotiations on collective negotiation outcomes were theoretically as well as operationally meaningful.

In addition, we had two process measures; these were information sharing and relationship establishment. Fifteen papers reported measures of information sharing which generated 24 effect sizes. Information sharing included measures such as information exchange

rates, communication volume, or the extent to which negotiators gained insight into each others' interests. Relationship establishment was reported in 17 papers and 28 effect sizes, and was measured by the display of affect between negotiators such as the amount of trusting acts, the interpersonal atmosphere, and perceptions of a shared identity.

Coding Scheme and Analysis

Table 2 provides an overview of each category in our coding scheme and a description of each moderator. Two raters assessed all the studies, conducted the coding for each individual study, and determined how potential moderators were handled. Number of parties was coded dichotomously such that negotiations were either multiparty or dyadic. Similarly, the number of negotiation issues was dichotomously coded as being single-issue distributive or multi-issue integrative. To resolve any residual disagreements, coders went back to the research report together and reached consensus on the appropriate code.

The overall goal of this review is to assess the strength of a relation between communication media and three dependent variables (negotiation outcomes, information sharing, and relationship establishment). 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 (e.g. Cooper & Hedges, 1994). Meta-analysis is a statistical method for aggregating research findings across many studies examining the same question (Hedges & Becker, 1986) and is ideal for synthesizing research. 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 differences between communication media. 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 (e.g., Rosenthal, 1994). 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. According to convention, effect sizes of *r* = .1 can be considered small effects, while *r* = .3 are considered medium size effects and *r* = .5 are considered large effects (Cohen, 1977). The benefits of conducting a meta-analysis are that it allows us to examine and compare the magnitude of effects, as well as examine systematic variation in effect sizes across studies. Tests of the hypotheses were conducted using conventional meta-analytic procedures in a fixed-effects model (Cooper & Hedges, 1994; Lipsey & Wilson, 2001).

Results

Overall, the number of effect sizes was sufficient in all meta-analyses to allow for meaningful comparisons between groups of studies for the identified moderators. For higher order interactions (effects of moderators *within* each type of meta-analysis), we only reported average weighted effect sizes when categories contained at least three different studies. In order to prevent biases from the impact that face-to-face communication has (e.g. in the synchronous, audio, and visual meta-analysis), we report the overall medium characteristic main effect with and without its influence. Moderator analyses include face-to-face conditions. In the next sections, we will systematically review the identified effects of communication media on three different negotiation variables. As mentioned before, we will start with time-place models of interaction, followed by capacity approaches, while looking at the moderating factors as suggested by contextual approaches.

Meta-Analysis 1: Media Effects on Outcomes

Synchronous vs. asynchronous. The results in Table 3 summarize the impact of synchronous over asynchronous communication on negotiation outcomes. Hypothesis 1a was supported: synchronous communication resulted in significantly higher outcomes than asynchronous communication (r_w = .23, Z = 6.83, p < .001). The effect of synchronicity was also positive though weaker when face-to-face was left out of the analysis (r_w = .13, Z = 2.14, p = .03).

Due to the limited amount of effect sizes, we were only able to assess the moderating influence of the number of negotiation issues on the effect of synchronicity. Hypothesis 4a was supported: synchronous (versus asynchronous) communication had a larger positive impact on outcomes in single-issue distributive negotiations (r_w = .35) than in multi-issue integrative negotiations (r_w = .19), ($Q_{b,}\chi^2$ (1) = 4.40, p = .04).

Co-located vs. dispersed. The results also support hypothesis 1d regarding the impact of co-located versus dispersed media on outcomes: co-located communication resulted in significantly higher outcomes than dispersed communication (r_w = .25, Z = 7.87, p < .001).

The effect of different moderators is also shown in Table 3. Support was found for hypothesis 3a regarding the number of parties such that the effect of co-located (versus dispersed) communication on outcomes was stronger in multiparty settings (r_w = .41) than in dyadic settings (r_w = .23), ($Q_{b,}\chi^2$ (1) = 3.07, p = .08). However, no support was found for hypothesis 4a: co-located (versus dispersed) communication did not have a different impact on outcomes in single-issue distributive negotiations (r_w = .24) compared to multi-issue integrative negotiations (r_w = .25), ($Q_{b,}\chi^2$ (1) = .02, *ns*).

Audio vs. no audio. Table 3 also summarizes the impact that audio has on negotiation outcomes. Overall, the presence of audio resulted in higher outcomes (r_w = .32, Z = 11.15, p < .001), supporting hypothesis 2a. This effect was more pronounced when face-to-face was left out of the analysis (r_w = .51, Z = 7.80, p < .001).

However, no support was found for hypothesis 3a: although there is a trend in the right direction, the impact of audio (versus no audio) communication did not differ between multiparty settings (r_w = .41) and dyadic settings (r_w = .31), (Q_b, χ^2 (1) = .99, *ns*). Marginal support was found for expectations regarding hypothesis 4a: audio (versus no audio) communication had a larger positive impact on outcomes in single-issue distributive negotiations (r_w = .37) than in multi-issue integrative negotiations (r_w = .27), (Q_b, χ^2 (1) = 3.14, p = .08).

Visual vs. no visual. The data further reveals the added value of visual cues. Overall, outcomes were higher when visual cues were available compared to when they were not (r_w = .23, Z = 8.67, p < .001), supporting hypothesis 2d. In addition, this effect was slightly less positive when face-to-face was excluded from the analysis, for example when contrasting videoconferences with audio conferences (r_w = .16, Z = 2.58, p = .01).

Support was found for hypothesis 3a. As predicted, the impact of visual cues (versus no visual cues) on outcomes was stronger in multiparty settings (r_w = .41) compared to dyadic settings (r_w = .21), (Q_b, χ^2 (1) = 3.82, p = .05). However, hypothesis 4a was not confirmed: the impact of visual cues (versus no visual cues) on negotiation outcomes did not differ between single-issue distributive and multi-issue integrative negotiations (r_w's = .23), (Q_b, χ^2 (1) = .00, *ns*).

Meta-Analysis 2: Media Effects on Information Sharing

In the second series of meta-analyses, we tested how information sharing was affected by the characteristics of the media being used. Results can be found in Table 4.

Synchronous vs. asynchronous. Synchronous communication resulted in more information sharing than asynchronous communication (r_w = .49, Z = 8.12, p < .001), supporting hypothesis 1b. Unfortunately, the limited amount of effect sizes did not allow us to examine the impact of moderating variables.

Co-located vs. dispersed. We found support for hypothesis 1e: more information sharing was found in co-located settings compared to dispersed settings (r_w = .28, Z = 6.57, p < .001).

Effects could not be computed for the moderating influence of the number of parties since the number of studies did not allow us to make meaningful comparisons. Hypothesis 4b was supported: the impact of co-location (versus dispersed settings) on information sharing was larger in multi-issue integrative negotiations (r_w = .35) than in single-issue distributive negotiations (r_w = .11), (Q_b, χ^2 (1) = 6.98, p = .008).

Audio vs. no audio. Overall support was found for hypothesis 2b: the presence of audio resulted in more information sharing compared to media without audio (r_w = .32, Z = 7.61, p < .001). This effect was somewhat similar when face-to-face was left out of the analysis (r_w = .28, Z = 3.87, p < .001).

Again, no differences could be calculated for the number of parties because of the limited number of effect sizes. Hypothesis 4b was not supported: the impact of audio (versus no audio) on information sharing was somewhat equal for single-issue distributive negotiations (r_w = .35) and multi-issue integrative negotiations (r_w = .31), (Q_b, χ^2 (1) = .21, *ns*).

Visual vs. no visual. The data further reveals a small but significant overall effect size for the added value of visual cues on information sharing, providing support for hypothesis 2e. That is, more information is being shared between negotiators when visual cues are available compared to when they are not (r_w = .18, Z = 5.48, p < .001). This effect was similar when face-to-face was left out of the analysis, r_w = .13, Z = 2.26, p = .02 (e.g. contrasting videoconferencing and audio conferencing).

Due to the small sample size, no effects could be calculated for number of parties. Although the means were in the predicted direction, hypothesis 4b was not supported: the impact of visual cues (versus no visual cues) on information sharing was similar for single-issue distributive negotiations (r_w = .15) and multi-issue integrative negotiations (r_w = .20), ($Q_{b,}$ χ^2 (1) = .51, *ns*).

Meta-Analysis 3: Media Effects on Relationship Establishment

The last series of meta-analyses tested how relationship establishment was affected by communication media. An overview of results can be found in Table 5.

Synchronous vs. asynchronous. Hypothesis 1c was not supported: synchronous communication did not result in better relationships than asynchronous communication (r_w = .05, Z = 1.26, *ns*). This effect was also non-significant when face-to-face was left out of the analysis (r_w = .01, Z = .14, *ns*).

Co-located vs. dispersed. In support of hypothesis 1f, the data revealed that co-located negotiations resulted in better relations compared to dispersed negotiations (r_w = .09, Z = 2.72, p = .007). Unfortunately, we could not examine the influence of moderators due to a lack of effect sizes.

Audio vs. no audio. Negotiations with audio resulted in somewhat better relationships than those without audio (r_w = .13, Z = 3.68, p < .001), providing support for hypothesis 2c. This effect was somewhat stronger when face-to-face was left out of the analysis (r_w = .23, Z = 4.14, p < .001).

Due to sample size, we could only test the moderating influence of the number of negotiation issues. In support of hypothesis 4c, we found that the impact of audio (versus no audio) on relationship establishment was larger in single-issue distributive negotiations (r_w = .49) than in multi-issue integrative negotiations (r_w = .05), ($Q_{b,}\chi^2$ (1) = 23.50, p < .001).

Visual vs. no visual. Hypothesis 2f was not supported: the presence of visual cues did not result in more relationship establishment (r_w = -.01, Z = -.18, *ns*). When face-to-face was left out of the analysis (e.g. when contrasting videoconferences from other media), we found that the presence of visual cues had a negative impact (r_w = -.13, Z = -2.61, p = .01) on relationships.

Although we could not test the moderating impact of the number of parties, we found support for hypothesis 4c: the impact of visual cues (versus no visual cues) was larger in single-issue distributive negotiations (r_w = .47) than in multi-issue integrative negotiations (r_w = -.06), ($Q_{b,}\chi^2$ (1) = 33.67, p < .001).

Discussion

Although the magnitude of effects within all meta-analyses was variable (ranging from weakly negative to strongly positive), we found broad support for the predicted effects of communication media on negotiation outcomes, information sharing, and

relationship establishment (see Table 6). Importantly, the data supports predictions derived from the time-place model, capacity- and contextual approaches.

Findings

Medium synchronicity. In line with our predictions, we found that synchronous communication media led to considerably higher outcomes and that this effect was stronger when negotiations were single-issue distributive. In addition, synchronous communication media led to much more information sharing than asynchronous media. However, synchronicity did not have an effect on relationship establishment. In other words, the absence of synchronous communication leads to considerable losses, both in terms of the outcome as well as the amount of information exchanged.

Co-located communication. Negotiation outcomes are considerably higher when negotiators are co-located than when they are dispersed. Furthermore, and as predicted, this effect is stronger in multiparty settings than in dyadic settings. The impact of co-location on outcomes was equally strong in single-issue distributive and multi-issue integrative negotiations. Co-located negotiations also led to considerably more information sharing compared to geographically dispersed negotiations. In line with predictions, this was moderated by the number of negotiation issues, such that the effect of co-location on information sharing was stronger for multi-issue integrative negotiations. Furthermore, co-located settings had a weak but positive effect on the relationships established between negotiators. Geographically dispersed negotiations are thus likely to result in lower outcomes, less information exchange, and worse relationships, especially when more than two parties are involved.

Audio cues. The presence of audio cues affected the outcome of negotiations as well: the outcome was considerably higher when audio cues were present. Furthermore, and as predicted, this effect was stronger when negotiations involved multiple parties rather than two and were single-issue distributive rather than multi-issue integrative. In a similar vein, the presence of audio led to considerably more information sharing between negotiations. Contrary to predictions, we did not find support for a moderated influence of the number of issues. Instead, the presence of audio was found to be equally beneficial to both single-issue distributive and multi-issue integrative negotiations. Furthermore, the presence of audio cues had a weak, but positive effect on relationship establishment between negotiators, especially when these involved single-issue distributive rather than multi-issue integrative negotiations. In other words, the absence of audio is likely to result in significant negotiation losses, especially in terms of collective negotiation outcomes and information sharing.

Visual cues. Visual cues contributed considerably to higher negotiation outcomes. Moreover, and as predicted, this effect was stronger in multi-issue multiparty negotiations. No support was found for the predicted impact of the number of issues. The presence of visual cues contributed somewhat to information sharing. However, we did not find the added value of visual cues to be stronger in multi-issue integrative negotiations. Instead, multi-issue integrative and single-issue distributive negotiations profited equally from the presence of visual cues. Visual cues did not affect relationship establishment. Excluding face-to-face from the analyses even resulted in a negative relationship such that the presence of visual cues deteriorated relations between the parties in multi-issue integrative negotiation while visual cues had a very strong and

positive impact in single-issue distributive negotiations. A lack of visual cues may thus have serious and negative consequences in terms of negotiation outcomes and information sharing, especially when the negotiation involves multiple parties.

Overall, we find broad support for predictions regarding the main effects of communication characteristics on the three variables of interest: all but one, were supported (see Table 6). Although visual cues had a positive impact on both negotiation outcomes and information sharing, its effects on relationship establishment were close to zero. Nevertheless, negotiation outcomes were positively affected by different media characteristics (r's > .23). Although information sharing was also positively affected by several medium characteristics (r's > .18), it benefited especially from synchronicity (r = .49). The impact of medium characteristics on relationship establishment, however, was less strong overall (r's ranging from -.01 through .13). At this point, it is also interesting to compare the impact of different media characteristics for each dependent variable. For collective negotiation outcomes for example, it is interesting to see that negotiations over the phone are equally effective as face-to-face negotiations whereas the presence of synchronicity is most important when information has to be shared (rather than visual cues). In terms of the relationships established, we found that these were most positively affected when audio and visual cues were present, but only when negotiations were single-issue distributive.

Similarly, we found support for the moderation hypothesis regarding the number of parties such that the presence of medium characteristics on negotiation outcome, information sharing, and relationship establishment was more positive and pronounced when negotiations involved multiple parties rather than two.

Mixed support was found for the predicted moderation regarding the number of negotiation issues. As predicted, the impact of synchronicity and audio on negotiation outcomes was stronger for multi-issue integrative negotiations than for single-issue distributive negotiations. However, the impact of co-location and visual cues on outcomes was equally strong for both multi-issue integrative and single-issue distributive negotiations. A possible explanation for this finding could be that in resolving more competitive, single-issue distributive negotiations, it is especially important to have access to nonverbal aspects of communication. In other words, a lack of nonverbal cues in distributive negotiations contributes to increased suspicion and incredulity, undermining the ability to establish positive negotiation outcomes. Future research should investigate these issues in more detail.

Mixed evidence was also found for hypotheses regarding information sharing and the moderated impact of the number of issues. Although co-location had a stronger impact on information sharing in multi-issue integrative negotiations, we did not find such an effect for the impact of audio or visual cues. Instead, the impact of both audio and visual cues was equally strong for the two types of negotiations. One explanation for this finding is that both single-issue distributive and multi-issue integrative negotiations involved an equal amount of information exchange which differed in nature: whereas a high exchange was necessary to resolve the complex nature of integrative, multi-issue negotiations, resolving distributive, single-issue negotiations in (computer) mediated settings may have resulted in the display of more negatively laden communication or so-called “flaming”, which in turn, might have been responsible for an increase in information exchange (Kiesler et al., 1984). Thus, whereas the actual volume of

information exchanged was the same for multi-issue integrative and single-issue distributive negotiations, the nature of this exchange was likely to be different.

Limitations and Issues for Future Research

Number of effect sizes. Unfortunately, our literature search did not reveal sufficient effect sizes to study the influence of each moderator in all meta-analyses. For example, effects of media synchronicity in particular have been under-explored which is why we were not able to test the circumstances under which its influence was more or less pronounced. Also, we were not able to examine the impact of using multiple media at the same time since this has not been investigated in many studies. Interestingly, it can be argued that people nowadays do not rely on one medium alone for their negotiations but instead, rely on a combination of face-to-face meetings, phone conversations, and email correspondence. How this confluence in media use affects negotiators' understandings of others, and affects their outcomes, remains an interesting question for future research.

Levels of analysis. The meta-analyses did not allow us to test other relevant moderators. Although our analyses focused on socio-structural factors related to the group-level (the number of parties) and aspects of the task (the number of negotiation issues), we were not able to examine individual-, interpersonal, or organization- level variables. For example, recent research has demonstrated how familiarity with the other negotiator may help to overcome the potential drawbacks that communication media have. That is, short phone conversations, or so-called "schmoozing" where negotiators get to know each other better before they start to negotiate may increases the outcome of electronically mediated negotiations (Morris, Nadler, Kurtzberg & Thompson, 2002; Nadler, 2004; Thompson & Nadler, 2002). In a similar vein, it has been demonstrated that electronic negotiations with others with whom a common group

membership was shared, resulted in higher outcomes compared to those in which this was not the case (Moore, Kurtzberg, Thompson & Morris, 1999; Thompson, 1993). Although this effect has thus far only been demonstrated in dyadic negotiations and not in multiparty negotiations, it shows that some level of familiarity or common group membership may be sufficient to overcome the barriers that communication media impose.

Although recent advances have been made in the examination of cultural influences, we could not incorporate these in the current meta-analysis because of the limited number of effect sizes. Although most of the studies in our meta-analysis used Western samples (e.g. United States and Great Britain), some studies were conducted in Asian countries (e.g. Korea). However, no studies in the present sample focused on a comparison between media in intercultural negotiations. This is somewhat surprising given the fact that these types of negotiations lend themselves to be conducted through communication media in order to save time and money. Future research should focus in more detail on these issues since its insights may be extremely valuable for those operating in a geographically dispersed, and culturally diverse, business environment.

Within media differences. The study of culture in the field of communication media and negotiations becomes an increasingly important field of research in a growing globalized business community. This also points to another research domain we were not able to capture in the present analysis, namely those studies where media function as the communication *setting* for negotiation. For example, it has been found that *within* email negotiations, people from individualistic cultures are less accurate in estimating others' interests compared to those from collectivistic cultures (Gelfland & Christakopoulou, 1999). In addition, others found email negotiations among people from collectivistic cultures to result in more integrative

tactics compared to email negotiations between people from individualistic and collectivistic cultures (Rosette, Brett, Barsness & Lytle, 2004). These inter-cultural email negotiations were further characterized by more aggressive behavior (Rosette et al., 2004).

Another limitation of the present meta-analyses is that we were not able to capture studies focusing on the impact of subtle differences within media. For example, Kern and colleagues (2004) found that public chat settings resulted in higher negotiation outcomes, more positive relational influence and more constructive information sharing than settings that allowed for private or secret computer mediated communication (Kern et al., 2004). Similarly, it has been demonstrated how subtle differences such as the presence of eye-contact in webcam negotiations contributed to a better understanding of information and increased prosocial behavior (Swaab & Swaab, 2004). Another field of research that focuses on within media differences not included in the present analysis is that on Negotiation Support Systems (NSS). NSS are support systems designed to support (co-located) negotiations by means of several decision aids, ranging from sophisticated simulation models to three-dimensional problem visualizations (Holsapple, Lai & Whinston, 1998; Lim & Benbasat, 1993; Swaab, Postmes & Neijens, 2004). However, because of its specific nature we left it out of consideration in the present analysis.

Interaction between variables. Unfortunately, we were not able to examine the interaction between information sharing, relationship establishment, and negotiation outcomes in the present meta-analyses. The main reason for this was that we did not find enough studies examining these variables in conjunction with each other or studies that reported a relationship between them. Although other reviews explored the interactions between these type of variables within and outside the domain of negotiations (Kerr & Tindale, 2004), they do not

speak to the area of communication media in negotiations. However, based on our results and previous insights we can speculate about the processes that drive higher negotiation outcomes in various communication media.

For example, the synchronicity and visual cues analyses suggest that higher outcomes are a result of increased information exchange. That is, the strong resemblance between patterns of outcomes and information sharing in both synchronous and visual cues analyses may suggest that increased negotiation outcomes are driven by the exchange of information. In other words, the ability to directly respond to others' or to see the other's facial expression may be responsible for more information exchange necessary to establish higher outcomes.

In the co-location and audio meta-analyses, results suggested that the routes to negotiation outcomes may be both informational and relational in nature. Here, there was strong resemblance between the patterns such that negotiation outcomes, information sharing and relationship establishment were all higher when negotiations were co-located or conducted through audio channels. Nonetheless, future research should investigate the underlying mechanisms in more detail since our results only provide suggestions into the possible paths.

Implications

At the start of this paper we proposed that in considering the effects of communication media one should focus on the joint impact of a series of theories. The theoretical significance of such an integrated approach became apparent in the current analysis in that it helped us structure the field of communication media effects in negotiations. Theoretically, it has helped us to disentangle the different shades of theories and perspectives, and make sense of the different research questions that have been addressed in this relatively new field of research.

Interestingly, our results also imply that different theoretical perspectives are not antagonistic as far as negotiations concern. This could be considered as a surprising finding since debates within the field of computer communication research often revolved around these issues (e.g. that the presence of certain medium characteristics are not straightforward but and can have a negative impact as well). Rather, it seems there is a special case to argue for the influence of communication media in negotiations because the analyses reveal remarkable and noteworthy support regarding the validity of time-place, capacity-, and contextual approaches. For example, synchronicity, co-location, audio-, and visual cues all positively affect a range of negotiation variables. At the same time, support for these theories may be considered as less surprising if one considers the scientific roots of the CMC research as we know it today. That is, Social Presence Theory (Short et al., 1976) laid the foundations for the Reduced Social Cues approach (Kiesler et al., 1984) and Media Richness Theory (Daft & Lengel, 1986), but used labor union negotiation studies as theory testing ground (Short, 1972). So, original theories and assumptions were all based on contexts emphasizing negotiation and social conflict but attempts to generalize these findings to contexts other than negotiations, like the Task-Media Fit model tried to do (McGrath & Hollingshead, 1993) failed because medium effects are dependent on more than the task people deal with alone (El-Shinnawy & Markus, 1992; Kinney & Watson, 1992). Our findings do not imply that one approach prevails over another but instead illustrates that researchers have to embrace different theoretical perspectives in order to gain an accurate understanding of media effects in negotiation and decision making.

Our results have also noteworthy implications for practice. For example, the overall effect of co-location on all three variables of interest is strong and positive. Co-located negotiations should be preferred over geographically dispersed ones, especially when

negotiations are multiparty. Oftentimes however, this mode of communication is not available because of time or budgetary constraints. These findings can help negotiators determine whether a meeting is worth the costs. In addition, our results can help evaluate other alternatives. Perhaps the easiest (and equally effective) alternative is to conduct negotiations through settings in which audio is available. So, rather than negotiating by email or computerized chats, a phone call positively affects the likelihood of attaining higher negotiation outcomes, increased information sharing, and improved relationships between negotiators. It should further be noted that audio is indispensable when higher outcomes and positive relationships are to be established in single-issue distributive negotiations.

If audio is not a feasible option and negotiations are held textually, synchronous media are recommended, which implies that instant messaging (IM) should be used instead of email. That is, compared to asynchronous media, synchronous communication benefits the attainment of higher negotiation outcomes, facilitates information sharing, and positively affects relationships between negotiators. In addition, the use of synchronous media is especially important when negotiators aim to establish higher outcomes in multiparty or single-issue distributive negotiations. Although IM is not as common for business transactions yet, our results point to the additional value it might bring to the bargaining table.

If one aims to establish high collective negotiation outcomes or facilitate the exchange of information, it can be recommended to add visual channels to the conversation (e.g. by using a webcam), especially so when more than two parties are involved. However, visual cues do not have a straightforward impact on the establishment of negotiator's relationships: although they contribute to better relationships when negotiations are distributive, they do not necessarily do so in integrative settings. It should be noted here that streaming video feeds

should be available in using webcams since the absence thereof may impoverish communication between negotiators severely, and potentially damage their relationship.

Taken together, our results suggest that it is of crucial importance for negotiators to carefully consider their goals, communication media, and the context in which negotiations take place, especially if face-to-face is not a feasible option. A failure to do so may result in important process and outcome losses. It should be noted here that in the present paper we only on focused on situations where high collective outcomes, information exchange, and relationship establishment belong to the negotiator's goals. If this is not the case however, and a negotiator's primary goal is obtaining as much profit as possible, our conclusions do not necessarily hold. For example, recent studies found that asynchronous communication may sometimes be empowering from an individual's point of view, depending on one's alternatives to the negotiation (Loewenstein et al., 2005). Nevertheless, the selection of communication media should be a thoughtful process rather than a reliance on the most accessible or convenient option since it may provide strategic benefits to the manager.

Conclusion

Research on communication media in negotiation is a rapidly growing, multidisciplinary, field. Most of the research included in this meta-analysis was conducted in the last two decades (1985-2005), and originated from disciplines like Communication Science, Psychology, Economics, Organizational Behavior, and Information Systems. In it, we can see the contours of a new approach to studying communication media in negotiations, moving beyond an overriding concern with time-place models, capacity-, or contextual approaches alone, and instead moving to a more integrated approach. The first conclusion drawn from this quantitative synthesis is that its results justify the excitement about introducing

technology in the field of negotiation: results demonstrate that the choice for a specific medium may have large implications in terms of negotiation outcomes and the processes generally associated with these outcomes. However, the research also shows that a failure to treat communication media as a source of competitive advantage may lead to considerable losses. This emphasizes once more why managers should carefully consider their communication media.

The second conclusion we draw from this meta-analysis is that it provides clear and straightforward advice about how, why, and when one should use communication media in negotiations. That is, it answers how one should cope with communication media depending on the primary purpose (high collective negotiation outcomes, informational, or relational), what can be done to realize this purpose (e.g. add or remove audio, visual, or synchronicity), and the circumstances under which this is especially important to do (e.g. moderating influences). Thereby, it is also informative for which communication media should be avoided.

In sum, despite the sometimes understandable skepticism about the utility of technologies to negotiations, the study of communication media increasingly proves that negotiations benefit considerably when one carefully considers the context and aspects of the medium with which to communicate, instead of relying on assumptions and a priori beliefs alone. With a next generation of future leaders waiting to climb corporate ladders and more accustomed to technology than ever before, we recognize such issues to become increasingly important and fruitful for future research.

References[3]

*Arunachalam, V., & Dilla, W. N. (1992). Computer-mediated communication and structured interaction in transfer pricing negotiation. *Journal of Information Systems, 6*, 149-170.

*Arunachalam, V., & Dilla, W. N. (1995). Judgment accuracy and outcomes in negotiation: A causal modeling analysis of decision-aiding effects. *Organizational Behavior and Human Decision Processes, 61*, 289-304.

Baltes, B. B., Dickson, M., Sherman, M. P., Bauer, C. C., & LaGanke, J. S. (2002). Computer-mediated communication and group decision making: A meta-analysis. *Organizational Behavior and Human Decision Processes, 87*, 156-179.

Baron, J. (1995). Blind justice: Fairness to groups and the do-no-harm principle. *Journal of Behavioral Decision Making, 8*, 71-83.

*Barsness, Z., & Tenbrunsel, A. E. (1998). *Technologically-mediated communication and negotiation: Do relationships matter?* Paper presented at the International Association for Conflict Management, College Park, Maryland.

Carlson, J., & Zmud, R. (1999). Channel expansion theory and the experiential nature of media richness perceptions. *Academy of Management Journal, 42*, 153-170.

*Carnevale, P., & Isen, A. M. (1986). The influence of positive affect and visual access on the discovery of integrative solutions in bilateral negotiation. *Organizational Behavior and Human Decision Processes, 37*, 1 - 13.

*Carnevale, P. J., Pruitt, D. G., & Seilheimer, S. D. (1981). Looking and competing: Accountability and visual access in integrative bargaining. *Journal of Personality and Social Psychology, 40*, 111-120.

*Croson, R. T. A. (1999). Look at me when you say that: An electronic negotiation simulation. *Simulation & Gaming, 30*, 23-37.

*Crott, H., Kayser, E., & Lamm, H. (1980). The effects of information exchange and communication in an asymmetrical negotiation situation. *European Journal of Social Psychology, 10*, 149 - 163.

Daft, R. L., & Lengel, R. (1986). Organizational information requirements, media richness and structural design. *Management Science, 32*, 554-571.

Daft, R. L., Lengel, R. H., & Trevino, L. K. (1987). Message equivocality, media selection and manager performance: Implications for information systems. *MIS Quarterly, 11*, 355-366.

De Dreu, C. K. W., & Carnevale, P. (2003). Motivational bases for information processing and strategy in negotiation and conflict. In M. P. Zanna (Ed.), *Advances in experimental social psychology* (Vol. 35). NY: Academic Press.

De Dreu, C. K. W., Weingart, L. R., & Kwon, S. (2000). Influence of social motives on integrative negotiation: A meta-analytic review and test of two theories. *Journal of Personality and Social Psychology, 78*, 889 - 905.

Dennis, A. R., & Valacich, J. S. (1999). *Rethinking media richness: Towards a theory of media synchronicity.* Paper presented at the IEEE, Hawaii.

Dennis, A. R., Valacich, J. S., Speier, C., & Morris, M. (1998). Beyond media richness: An empirical test of media synchronicity theory. *IEEE Transactions on Communication*.

*Drolet, A. L., & Morris, M. W. (2000). Rapport in conflict resolution: Accounting for how face-to-face contact fosters mutual cooperation in mixed-motive conflicts. *Journal of Experimental Social Psychology, 36*, 26 - 50.

El-Shinnawy, M. M., & Markus, M. L. (1992). *Media richness theory and new communication media: A study of voice mail and electronic mail.* Paper presented at the ICIS, Dallas, TX.

*Fry, W. R. (1985). The effect of dyad machiavellianism and visual access on integrative bargaining outcomes. *Personality and Social Psychology Bulletin, 11*, 51-62.

Gelfland, M. J., & Christakopoulou, S. (1999). Culture and negotiator cognition: Judgment accuracy and negotiation processes in individualistic and collectivistic cultures. *Organizational Behavior and Human Decision Processes, 79*, 248-269.

*Harmon, J. (1998). Electronic meetings and intense group conflict: Effects of a policy-modeling performance support system and an audio communication support system on satisfaction and agreement. *Group Decision and Negotiation, 7*, 131-155.

Hedges, L. V., & Becker, B. J. (1986). Statistical methods in the metaanalysis of research on gender differences. In J. S. Hyde & M. C. Linn (Eds.), *The psychology of gender: Advances through meta-analysis* (pp. 14–50). Baltimore: Johns Hopkins University Press.

Holsapple, C. W., Lai, H., & Whinston, A. B. (1998). A formal basis for negotiation support system research. *Group Decision and Negotiation, 7*, 203-227.

Hunter, J. E., & Schmidt, F. L. (1990). *Methods of meta-analysis: Correcting error and bias in research findings*. Beverly Hills, CA: Sage.

*Jain, B. A., & Solomon, J. S. (1999). The effect of task complexity and conflict handling styles on computer-supported negotiations. *Information & Management, 37*, 161 - 168.

*Kern, M., Medvec, V. H., Diermeier, D., & Swaab, R. I. (2004). *Shut out of the deal: The impact of communication channels in multiparty negotiations.* Paper presented at the International Association of Conflict Management, Pittsburgh, PA.

Kerr, N. L., & Tindale, R. S. (2004). Group performance and decision making. *Annual Review of Psychology, 55*, 623-655.

Kiesler, S., Siegel, J., & McGuire, T. W. (1984). Social psychological aspects of computer-mediated communication. *American Psychologist, 39*, 1123-1134.

Kimmel, M., Pruitt, D. G., Magenau, J., Konar-Goldband, E., & Carnevale, P. J. (1980). The effects of trust, aspiration, and gender on negotiation tactics. *Journal of Personality and Social Psychology, 38*, 9-23.

*King, D. C., & Glidewell, J. C. (1980). Dyadic bargaining outcomes under individualistic and competitive orientations. *Human Relations, 33*, 781-803.

Kinney, S. T., & Watson, R. T. (1992). *The effect of medium and task on dyadic communication.* Paper presented at the ICIS, Dallas, TX.

Kramer, R. M., Pommerenke, P., & Newton, E. (1993). The social context of negotiation: Effects of social identity and interpersonal accountability on negotiator decision making. *Journal of Conflict Resolution, 37*, 633-654.

*Lewis, S. A., & Fry, W. R. (1977). Effects of visual access and orientation on the discovery of integrative bargaining alternatives. *Organizational Behavior and Human Performance, 20*, 75-92.

Lim, L.-H., & Benbasat, I. (1993). A theoretical perspective of negotiation support systems. *Journal of Management Information Systems, 9*, 27-44.

*Loewenstein, G. F., Morris, M., Chakravarti, A., Thompson, L., & Kopelman, S. (2005). At a loss for words: Dominating the conversation and the outcome in negotiation as a function of intricate arguments and communication media. *Organizational Behavior and Human Decision Processes, 98*, 28-38.

Loewenstein, G. F., Thompson, L., & Bazerman, M. H. (1989). Social utility and decision making in interpersonal contexts. *Journal of Personality and Social Psychology, 57*, 426-441.

McGrath, J. E., & Hollingshead, A. B. (1993). Putting the "group" back into group support systems: Some theoretical issues about dynamic processes in groups with technological enhancements. In L. M. Jessup & J. S. Valacich (Eds.), *Group support systems: New perspectives* (pp. 78- 79). New York, NYU: Macmillan.

*Mennecke, B. E., Valacich, J. S., & Wheeler, B. C. (2000). The effects of media and task on user performance: A test of the task-media fit hypothesis. *Group Decision and Negotiation, 9*, 507-529.

Moore, D. A., Kurtzberg, T. R., Thompson, L., & Morris, M. W. (1999). Long and short routes to success in electronically mediated negotiations: Group affiliations and good vibrations. *Organizational Behavior and Human Decision Processes, 77*, 22-43.

Morley, I. E., & Stephenson, G. M. (1969). Interpersonal and inter-party exchange: A laboratory simulation of an industrial negotiation at the plant level. *British Journal of Psychology, 60*, 543 - 545.

Morris, M., Nadler, J., Kurtzberg, T., & Thompson, L. (2002). Schmooze or lose: Social friction and lubrication in e-mail negotiations. *Group Dynamics, 6*, 89-100.

Murnighan, K., Babcock, L., Thompson, L., & Pillutla, M. (1999). The information dilemma in negotiations: Effects of experience, incentives, and integrative potential. *The International Journal of Conflict Management, 10*, 313 - 339.

Nadler, J. (2004). Rapport in legal negotiation: How small talk can facilitate email dealmaking. *Harvard Negotiation Law Review, 9*, 225 - 253.

*Naquin, C. E., & Paulson, G. D. (2003). Online bargaining and interpersonal trust. *Journal of Applied Psychology, 88*, 113-120.

*Pesendorfer, E. M., & Koeszegi, S. T. (2005). *The effect of communication mode on e-negotiations.* Paper presented at the Workshop on Formal and Informal Information Exchange in Negotiations, University of Ottawa, Canada.

Pinkley, R. L. (1995). "fixed pie" al la mode: Information availability, information processing, and the negotiation of suboptimal agreements. *Organizational Behavior and Human Decision Processes, 62*, 101-112.

Polzer, J. T. (1996). Intergroup negotiations: The effects of negotiating teams. *The Journal of Conflict Resolution, 40*, 678-698.

*Purdy, J. M., Nye, P., & Balakrishnan, P. V. (2000). The impact of communication media on negotiation outcomes. *The International Journal of Conflict Management, 11*, 162-187.

*Rangaswamy, A., & Shell, G. R. (1997). Using computers to realize joint gains in negotiations: Toward an "electronic bargaining table". *Management Science, 43*, 1147 - 1163.

*Rhee, H.-S., Pirkul, H., Jacob, V., & Barhki, R. (1995). *Effects of computer-mediated communication on group negotiation: An empirical study.* Paper presented at the 28th Annual Hawaii International Conference on System Sciences, Hawaii.

Rosette, A., Brett, J. M., Barsness, Z., & Lytle, A. (2004). When cultures clash electronically: The impact of e-mail and culture on negotiation behavior. *DRRC working paper*.

Rutter, D. R. (1987). *Communicating by telephone*. Oxford: Pergamon.

Rutter, D. R., & Stephenson, G. M. (1979). The role of visual communication in social interaction. *Current Anthropology, 20*, 124-125.

*Schweitzer, M. E., Brodt, S. E., & Croson, R. T. A. (2002). Seeing and believing: Visual access and the strategic use of deception. *International Journal of Conflict Management, 13*, 258-275.

*Sheffield. (1995). The effect of communication medium on negotiation performance. *Group Decision and Negotiation, 4*, 159-179.

Short, J., Williams, E., & Christie, B. (1976). *The social psychology of telecommunications*. London; New York: Wiley.

*Short, J. A. (1972). Conflict of opinion and medium of communication: Unpublished Communication Studies Group paper.

*Smith, D. H. (1969). Communication and negotiation outcome. *The Journal of Communication, 19*, 248-256.

Spears, R., & Lea, M. (1994). Panacea or panopticon? The hidden power in computer-mediated communication. *Communication Research, 21*, 427-459.

*Stephenson, G. M., Ayling, K., & Rutter, D. R. (1976). The role of visual communication in social exchange. *British Journal of Social & Clinical Psychology, 15*, 113-120.

Stuhlmacher, A.F. & Citera, M. (2005). Hostile behavior and profit in virtual negotiation: A meta-analysis. *Journal of Business and Psychology, 20,* 69-93.

*Suh, K. S. (1999). Impact of communication medium on task performance and satisfaction: An examination of media-richness theory. *Information & Management, 35*, 295 - 312.

Swaab, R. I., Postmes, T., & Neijens, P. (2004). The ecological validity of negotiation support systems: Information and communication as antecedents of negotiation support. *International Negotiation Journal, 9*, 59-78.

Swaab, R. I., & Swaab, D. F. (2004). Sex differences and eye-contact negotiations: Combining perspectives from neurobiological and communication domains. *Paper presented at the International Association for Conflict Management, Pittsburgh, US.*

Tanis, M. (2003). *Cues to identity in cmc: The impact on person perception and subsequent interaction outcomes.* University of Amsterdam, Amsterdam.

Thompson, L. (1990). Negotiation behavior and outcomes: Empirical evidence and theoretical issues. *Psychological Bulletin, 108*, 515-532.

Thompson, L. (1991). Information exchange in negotiation. *Journal of Experimental and Social Psychology, 27*, 161 - 179.

Thompson, L. (1993). The impact of negotiation on intergroup relations. *Journal of Experimental Social Psychology, 29*, 304-325.

Thompson, L. (2001). *The mind and heart of the negotiator* (2nd ed.). Upper Saddle River, NJ: Prentice-Hall, Inc.

Thompson, L., & Fine, G. A. (1999). Socially shared cognition, affect, and behavior: A review and integration. *Personality & Social Psychology Review, 3*, 278-302.

Thompson, L., & Nadler, J. (2002). Negotiating via information technology: Theory and application. *Journal of Social Issues, 58*, 109 - 124.

*Valley, K. L., Moag, J., & Bazerman, M. H. (1998). 'a matter of trust': Effects of communication on the efficiency and distribution of outcomes. *Journal of Economic Behavior & Organization, 34*, 211 - 238.

Valley, K. L., Thompson, L., Gibbons, R., & Bazerman, M. H. (2002). How communication improves efficiency in bargaining games. *Games and Economic Behavior, 38*, 127 - 155.

Walther, J. B., Anderson, J. F., & Park, D. W. (1994). Interpersonal effects in computer-mediated interaction: A meta-analysis of social and antisocial communication. *Communication Research, 21*, 460-487.

*Yang, G. (2003). *The impact of computer-mediated communication on the processes and outcomes of buyer-seller negotiations.* U California, Irvine, US.

*Yuan, Y., Head, M., & Du, M. (2003). The effects of multimedia communication on web-based negotiation. *Group Decision and Negotiation, 12*, 89-109.

Figure 1.

Independent variables, moderators, and negotiation variables

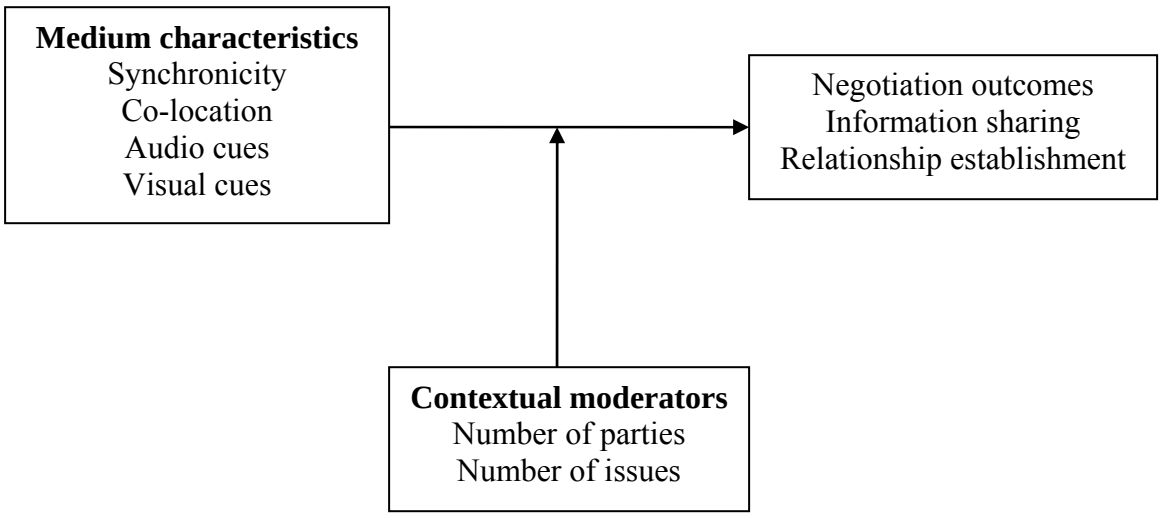

Table 1.
Study Characteristics and Effect Sizes for Mediated Negotiation Studies

	Effect size (*r*)			Meta-analyses					Moderators
	Dependent variable								
	OUT	INF	REL	Comparison	T	P	A	V	A	B
Arunachalam & Dilla, 1992	-	-	-	ftf-sync text	0	1	1	1	2	2
Arunachalam & Dilla, 1995	-	.44	-	ftf-sync text	0	1	1	1	2	2
Barsness & Tenbrunsel , 1998	.23	.32	.21	ftf-async text	1	1	1	1	1	2
Carnevale & Isen, 1986	-	-.43	-.81	visual-no visual	0	0	0	1	1	2
Carnevale & Pruitt, 1981	-	-.18	-.30	visual-no visual	0	0	0	1	1	2
Croson, 1999	.16	-	-	ftf-async text	1	1	1	1	1	2
Crott et al., 1980	-	-	.24	audio-async text	1	0	1	0	1	1
Drolet & Morris, 1999	.32	.66	.54	visual-no visual	0	0	0	1	1	1
Fry, 1985	-.07	-	-	visual-no visual	0	0	0	1	1	2
Harmon, 1998	-	-	-.37	ftf-audio	0	1	0	1	2	2
Jain & Solomon, 1999	-	.46	-	ftf-sync text	0	1	1	1	1	2
Kern et al., 2005 (Study 1)	.62	-	-	ftf-sync text	0	1	1	1	2	1
Kern et al., 2005 (Study 2)	.40	-	-	ftf-sync text	0	1	1	1	2	1
King & Glidewell, 1980	.39	-	-	ftf-audio	0	1	0	1	1	2
King & Glidewell, 1980	.55	-	-	ftf-pen/paper	1	0	1	1	1	2
King & Glidewell, 1980	.06	-	-	audio-pen/paper	1	0	1	0	1	2
Lewis & Fry, 1977	-	-	-.32	visual-no visual	0	0	0	1	1	2
Loewenstein et al, 2005	-	.71	-	sync text-async text	1	0	0	0	1	2
Mennecke et al., 2000	.23	-	-	ftf-video	0	1	0	0	1	1
Mennecke et al., 2000	.28	-	-	ftf-audio	0	1	0	1	1	1
Mennecke et al., 2000	.84	-	-	ftf-sync text	0	1	1	1	1	1
Mennecke et al., 2000	.05	-	-	video-audio	0	0	0	1	1	1
Mennecke et al., 2000	.81	-	-	video-sync text	0	0	1	1	1	1
Mennecke et al., 2000	.80	-	-	audio-sync text	0	0	1	0	1	1
Naquin & Paulson, 2003	.34	-	.89	ftf-async text	1	1	1	1	1	2
Pesendorfer & Koeszegi , 2005	-.12	.62	-.27	sync text-async text	1	0	0	0	1	2
Purdy et al., 2000	.31	-	.23	ftf-video	0	1	0	0	1	2
Purdy et al., 2000	.15	-	.21	ftf-audio	0	1	0	1	1	2
Purdy et al., 2000	.54	-	.22	ftf-sync text	0	1	1	1	1	2
Purdy et al., 2000	-.16	-	-.06	video-audio	0	0	0	1	1	2
Purdy et al., 2000	.33	-	-.06	video-sync text	0	0	1	1	1	2
Purdy et al., 2000	.44	-	-.06	audio-sync text	0	0	1	0	1	2
Rangaswamy & Shell, 1997	.30	-	-	ftf-async text	1	1	1	1	1	2
Rhee et al., 1995	.35	.45	.54	ftf-sync text	0	1	1	1	2	2

Note. OUT = Outcome, INF = Information sharing, REL = Relationship establishment, T = Time, P = Place, A = Number of parties, B = Number of issues

Table 1 (cont'd).
Study Characteristics and Effect Sizes for Mediated Negotiation Studies

	Effect size (*r*)			Meta-analyses					Moderators
	Dependent variable								
	OUT	INF	REL	Comparison	T	P	A	V	A	B
Schweitzer et al., 2002	-	.50	-.24	video-audio	0	0	0	1	1	2
Sheffield, 1995	-	.40	.09	ftf-audio	0	1	0	1	1	2
Sheffield, 1995	-	.08	.07	ftf-sync text	0	1	1	1	1	2
Sheffield, 1995	-	.00	.24	audio-sync text	0	0	1	0	1	2
Short, 1972a	.35	-	-	ftf-audio	0	1	0	1	1	1
Smith, 1969	.32	-	-	ftf-pen/paper	1	0	1	1	1	1
Stephenson et al., 1976	-	-.44	.43	ftf-audio	0	1	0	1	1	1
Suh, 1999	.04	.22	-	ftf-video	0	1	0	0	1	1
Suh, 1999	-.26	.27	-	ftf-audio	0	1	0	1	1	1
Suh, 1999	.46	.24	-	ftf-sync text	0	1	1	1	1	1
Suh, 1999	-.30	.08	-	video-audio	0	0	0	1	1	1
Suh, 1999	.43	.04	-	video-sync text	0	0	1	1	1	1
Suh, 1999	.67	-.03	-	audio-sync text	0	0	1	0	1	1
Valley et al., 1998 (Study 1)	.33	-	-	ftf-pen/paper	1	0	1	1	1	1
Valley et al., 1998 (Study 2)	-.05	-	-	ftf-audio	0	1	0	1	1	1
Valley et al., 1998 (Study 2)	.34	-	-	ftf-pen/paper	1	0	1	1	1	1
Valley et al., 1998 (Study 2)	.39	-	-	audio-pen/paper	1	0	1	0	1	1
Yang Guang, 2003	.17	-	-.15	ftf-sync text	0	1	1	1	1	2
Yang Guang, 2003	.26	-	-.09	ftf-async text	1	1	1	1	1	2
Yang Guang, 2003	.22	-	.08	synctext-asynctext	1	0	0	0	1	2
Yuan et al., 2003	-	.00	.18	video-audio	0	0	0	1	1	1
Yuan et al., 2003	-	.61	.67	video-sync text	0	0	1	1	1	1
Yuan et al., 2003	-	.62	.59	audio-sync text	0	0	1	0	1	1

Note. OUT = Outcome efficiency, INF = Information sharing, REL = Relationship establishment, T = Time, P = Place, A = Number of parties, B = Number of issues

Table 2.

Moderator variables

Comparisons		Categories / Scale		
T.	Time	0	no	Do media differ in terms of synchronicity?
		1	yes	
P.	Place	0	no	Do media differ in terms of geographical location?
		1	yes	
A.	Audio	0	no	Do media differ in audio cues provided?
		1	yes	
V.	Visual	0	no	Do media differ in visual cues provided?
		1	yes	
Moderators				
A.	Number of parties	1	Dyadic	
		2	Multiparty	
B.	Number of issues	1	Single-issue distributive	
		2	Multi-issue integrative	

Table 3.
Categorical moderators of the effect of media on negotiation outcomes

Meta-analytic	Central tendency							Tests of homogeneity	
comparison	r_w	95%	C.I.	K	Ngr	Nind	Z	Q_b Between	Q_w Within
Synchronicity	.23	.17	.30	13	866	2340	6.83***		13.50, *ns*
Number of issues								4.40*	
Single-issue	.35	.22	.47	4	242	570	5.39***		.29, *ns*
Multi-issue	.19	.11	.27	9	624	1770	4.69***		13.21, *ns*
Co-location	.25	.19	.31	21	1785	3648	7.87***		31.83*
Number of parties								3.07‡	
Dyadic	.23	.16	.30	18	1707	3414	6.83***		28.07*
Multiparty	.41	.22	.59	3	78	234	4.28***		.73, *ns*
Number of issues								.02, *ns*	
Single-issue	.24	.13	.35	10	803	1664	4.27***		24.45**
Multi-issue	.25	.18	.33	11	982	1984	6.61***		7.40, *ns*
Audio	.32	.26	.37	25	2052	4182	11.15***		50.81**
Number of parties								.99, *ns*	
Dyadic	.31	.25	.37	22	1974	3948	10.34***		49.09***
Multiparty	.41	.22	.59	3	78	234	4.28***		.73, *ns*
Number of issues								3.14‡	
Single-issue	.37	.29	.45	13	1046	2150	8.80***		37.84***
Multi-issue	.27	.20	.35	12	1006	2032	7.07***		9.84, *ns*

Note. $\underline{r_w}$ = weighted effect size, K = number of studies, Ngr = number of groups within studies, Nind = number of individuals within studies, *ns* > .10, ‡ < .10, * < .05, ** < .01, *** < .001

Table 3.
Categorical moderators of the effect of media on negotiation outcomes (continued)

Meta-analytic	Central tendency							Tests of homogeneity	
comparison	r_w	95%	C.I.	K	Ngr	Nind	Z	Q_b Between	Q_w Within
Visual	.23	.18	.28	31	2475	5082	8.67***		72.36***
Number of parties								3.82*	
Dyadic	.21	.16	.27	28	2397	4794	7.79***		67.82***
Multiparty	.41	.22	.59	3	78	234	4.28***		.73, *ns*
Number of issues								.00, *ns*	
Single-issue	.23	.16	.30	17	1358	2774	6.05***		55.47***
Multi-issue	.23	.16	.30	14	1117	2254	6.22***		16.90, *ns*

Note. r_w = weighted effect size, K = number of studies, Ngr = number of groups within studies, Nind = number of individuals within studies, *ns* > .10, ‡ < .10, * < .05, ** < .01, *** < .001

Table 4.
Categorical moderators of the effect of media on information sharing

Meta-analytic	Central tendency							Tests of homogeneity	
comparison	r_w	95%	C.I.	K	Ngr	Nind	Z	Q_b Between	Q_w Within
Synchronicity	.49	.37	.61	3	277	516	8.12***		2.70, *ns*
Co-location	.28	.20	.36	11	824	1728	6.57***		29.59***
Number of issues								6.98**	
Single-issue	.11	-.05	.26	5	519	1038	1.38, *ns*		17.74***
Multi-issue	.35	.25	.45	6	305	690	6.95***		4.87, *ns*
Audio	.32	.24	.40	11	899	1878	7.61***		28.91***
Number of issues								.21, ns	
Single-issue	.35	.20	.49	5	594	1188	4.63***		18.89***
Multi-issue	.31	.21	.40	6	305	690	6.05***		9.81‡
Visual	.18	.12	.25	19	1384	2848	5.48***		97.85***
Number of issues								.51, ns	
Single-issue	.15	.03	.26	8	797	1594	2.42*		30.81***
Multi-issue	.20	.12	.28	11	587	1254	4.97***		66.54***

Note. r_w = weighted effect size, K = number of studies, Ngr = number of groups within studies, Nind = number of individuals within studies, *ns* > .10, ‡ < .10, * < .05, ** < .01, *** < .001

Table 5.
Categorical moderators of the effect of media on relationship establishment

	Central tendency							Tests of homogeneity	
	$\underline{r_w}$	95%	C.I.	$\underline{K}$	$\underline{Ngr}$	$\underline{Nind}$	$\underline{Z}$	$\underline{Q_b}$ Between	$\underline{Q_w}$ Within
Synchronicity	.05	-.03	.14	6	544	1398	1.26, *ns*		26.24***
Co-location	.09	.03	.16	13	945	2010	2.72**		48.78***
Audio	.13	.06	.19	13	1048	2116	3.68***		64.29***
Number of issues								23.50***	
Single-issue	.49	.33	.65	3	198	396	5.94***		9.47-.009
Multi-issue	.05	-.02	.12	10	850	1720	1.33, *ns*		31.33***
Visual	-.01	-.06	.05	21	1428	2976	-.18, *ns*		136.44***
Number of issues								33.67***	
Single-issue	.47	.30	.63	4	165	330	5.41***		7.30‡
Multi-issue	-.06	-.12	.00	17	1263	2646	-2.10*		95.47***

Note. $\underline{r_w}$ = weighted effect size, $\underline{K}$ = number of studies, $\underline{Ngr}$ = number of groups within studies, $\underline{Nind}$ = number of individuals within studies, *ns* > .10, ‡ < .10, * < .05, ** < .01, *** < .001

Table 6.
Overview of results

	Main effect	Moderation number of parties	Moderation number of issues
Synchronous negotiations lead to..			
H1a higher outcomes	yes	-	yes
H1b more information sharing	yes	-	-
H1c better relationships	yes	-	-
Co-located negotiations lead to..			
H1d higher outcomes	yes	yes	no
H1e more information sharing	yes	-	yes
H1f better relationships	yes	-	-
Audio cues during negotiations lead to..			
H2a higher outcomes	yes	no*	yes‡
H2b more information sharing	yes	-	no
H2c better relationships	yes	-	yes
Visual cues during negotiations lead to..			
H2d higher outcomes	yes	yes	no
H2e more information sharing	yes	-	no
H2f better relationships	no	-	yes

Note. yes = hypothesis accepted, no = hypothesis rejected (effects equal for moderator values), - = hypothesis could not be tested, * = trend in predicted direction, ‡ $p < .10$.

Footnotes

[1] Although previous research has shown these three variables to be related to each other (De Dreu & Carnevale, 2003; Kerr & Tindale, 2004; Thompson & Fine, 1999) it is important to note that we focus solely on how communication media affect these three variables in isolation. The prime reason is that the amount of empirical studies in our meta-analysis does not allow us to test such interactions among variables.

[2] It should further be noted that a feeling to be geographically dispersed may already be sufficient to create these differences (Spears & Lea, 1994). For example, in-class exercises where participants believe they communicate with others in a different place (Kern et al., 2004) do not differ from settings where participants are geographically distributed (Purdy et al., 2000).

[3] References marked with an asterisk indicate studies included in the meta-analyses.