

Collaboration Technology Favoritism for Social Interactions

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ABSTRACT

The emergence of internet provides various media options for collaborative decision-makings in which tradeoffs is inevitable. The present study investigates the collaboration factors affecting the use of five popular media technologies (email, instant messaging, voice over internet protocol, webcam, and video conferencing) in deriving consensus. A three-way (task formality, task clarity and the familiarity with decision partners) factorial experiment was conducted to test hypotheses attributed to the Social Presence Theory, Media Richness Theory and cost concern. Vignettes were developed to solicit user's favoritism attitudes toward the five technologies. The results provided mixed supports of the formality effect for video conferencing, the clarity effect for webcam, and the relationship effect for both.

Keyword: Collaborative Decision-Making, Collaboration Technology, Media Selection, Favoritism

1. INTRODUCTION

Since the inauguration of internet, computer-mediated (CM) communication pertains to be a robust substitute for conventional communication such as telephone calls and letters, and inevitably becomes the widely adopted communication media in workplace [1, 2]. Tools facilitating the communications for group decision-makings are referred as collaboration technologies [3], including email, IM (Instant Massaging), Webcam, VoIP (Voice over Internet protocol) and Video Conferencing. The coexistence of these options may reflect various demands of communication purposes such as communication quality, effectiveness and lower cost [4]. Given the wide accessibility of internet, various technologies emerge in workplace as well as casual life.

Of the five technology options, tradeoff emerges between cost, message richness (text, voice and image), synchronicity, and the social presence of users. Taking email and VoIP as one extreme and face-to-face as the other end, video conferencing provides information for communication almost as rich as face-to-face could get whereas VoIP is close to telephone calls at an even cheaper price tag. In between, by adding voice onto email we have the IM. By adding image furthermore, we have the webcam. Webcam is a less expensive substitute for the costly video conferencing. The present study aims to investigate the collaboration factors that cause tradeoffs among media technologies.

Although the selection of CM communication technologies in workplace is not an unusual topic in prior research, it is rarely addressed in casual life situation. Yet, the popularity of virtual communities such as the Facebook endeavors a strong call for an in-depth study on the case of casual life CM communications. Thus the present study is motivated to make a comparison between the two communication situations. To this end, three factors are taken into account in the present study: task formality (formal versus casual), task clarity (clearly defined communication goals versus vaguely defined ones) and the

relationship of communication partners (colleagues, relatives and strangers).

Hypotheses regarding the information richness of media (video conferencing and webcam) are drawn attributed to the Social Presence Theory [5], Media Richness Theory [6], synchronicity[7] and cost concern [4]. Vignettes were designed to solicit media user's favoritism attitudes toward the five media with respect to eight communication scenarios. The results provide mixed supports for the hypotheses. In general, the results supported the formality effect for video conferencing, the clarity effect for webcam, and the relationship effect for both.

This paper is organized as follows: I firstly review the existing literature regarding media selection and drew hypotheses in the following section. Next, factorial designed vignettes involving three control factors are developed to test research hypotheses. Section 4 presents the analysis results of split-plot analysis of variance. The implications of results for organization settings are discussed in the final section.

2. LITERATURE

Media selection has been a topic in communication as well as collaboration decision-making studies for decades; nevertheless, this topic regains its significance in communication researches for the high penetration of tablet computers and the wireless linkage of internet. Herring [8] is one of the pioneer researchers who are aware of the potentiality of e-mail for the medium carries three important features that make them superior to conventional media: interactivity, non-linearity and asynchronism. Interactivity, firstly, attributes to the prompt response and timely feedback competences that Computer-Mediated (CM) media can offer. Users not only can communicate instantaneously but also can utilize multimedia formats of messages to enrich communication contents, which renders better communication quality and results in superior communication effectiveness [6, 9]. Secondly, CM media allow users to send and receive autonomously (non-linearity)[7]. Users for instance can prioritize his/her

handling (receiving, sending and feedback) of e-mails. Finally, the asynchronism [10] means that by using servers as buffers, users are not obliged to communicate with senders (or receivers) simultaneously. Messages are allowed accessing when users are available.

2.1. Theory of communication media

As CM media arise in various formats in the light of technologies, several communication media theories are adopted for categorizing media in perspectives irrespective of their technology characteristics. Short, Christie [5] propose the Social Presence Theory (SPT) by arguing that the cues presented by communication media exert communicator's social presence toward others, such as warm feeling and sensibility. On the one hand this leads to the Media Richness Theory [6] which argues that the richness of media associates with the degree of social presence and are better for collaboration involving vague task.

On the other hand, Sproull and Kiesler [10] argue that social cues may not be in need for communication; "sometimes less is more"[11, 12] ; and renders in the Social Context theory. "Lean media" as it is sometimes used in the literature [13, 14] may provide a totally new world for ones who expect to interact with others in a freedom of no current social presence. For example, a number of social networking sites (Facebook, QQ, etc.) allow users taking anonymity as web identity.

Lately, Media Naturalness Theory [15] takes a biological and evolutionary perspective to argue that face-to-face is the most natural and optimal communication mode. Naturalness of medium enhances communication effectiveness.

With those perspectives above, the CM media may provide an interesting occasion to investigate user's favoritism contingent under certain communication situations. On the one hand, CM media are enhanced to be as close as possible to face-to-face communication, such as webcam and video conferencing which can provide voice and image interaction

simultaneously. On the other hand, CM medium could also help to reduce social identities such as e-mail and IM in which involved parties could shield their social identities as well as emotions. For organization settings, these social cues present either in static formats such as organizational position or in dynamic formats such nonverbal gestures. And its behavior impacts as Sproull and Kiesler [10] have put:

“Typically, when social context cues are strong, behavior tends to be relatively other-focused, differentiated, and controlled. When social context cues are weak, people’s feelings of anonymity tend to produce relatively self-centered and unregulated behavior. That is, people become relatively unconcerned with making a good appearance. Their behavior becomes more extreme, more impulsive, and less socially differentiated (p.1495-1496, Sproull and Kiesler, 1986). “

The implication is if people can choose appropriate medium and transmit needed social cues, better communication effectiveness may be derived consequently. The “appropriateness” may subject to the task of communication and the participants involved in communication. In the following I will go over the literature regarding these two issues sequentially.

2.2. Task-media fitness

Communication task is one of the factors investigated in previous studies before the internet era. Since communication within organization takes a large share of human’s daily communication efforts, as a result previous studies were often done in organization settings. And subject to the advantages of media in different perspectives (context richness, anonymity, synchronicity and cost), effectiveness of communication may be contingent on the communication tasks [16-18]. For instance, Mennecke, Valacich [16] find that if the task of communication is for negotiation the richer of media the better of communication effectiveness. Nevertheless, the similar hypothesis was not supported with intellectual task. That is, richness of media is not necessitated for intellectual tasks such as generating ideas or

choosing correct answer. This unanswered question is pursued in the present study by categorizing intellectual tasks in two dimensions: formality of communication objects and clarity of communication issues. The related literature with respect to communication task is presented briefly as follows.

2.2.1. Task formality

Negotiation task by its nature requires more interactivities among involved parties compared to intellectual task [19]. Thus it may not be surprising that Mennecke, Valacich [16] did not get their hypotheses supported for intellectual task, for example to arrive a correct answer. It is to rich-media's (such as video conferencing) advantage of supporting interactivity among involved participants. The present study extends this thread of studies from where the communication task is for formal organizational issues to where the task is for casual issues.

Rich-media could provide more social cues than lean-media does. Indeed, formal tasks often ask for authority to make the final call. Hence, rich-media may better fit this requirement by providing more social cues to enhance authority. As a result rich-media may fit better for formal tasks compared to casual tasks.

H1(Formality): When tasks are for formal purposes (versus causal purposes) the presence of social cues (such as organizational position) could induce perception of authority and arrive conclusion efficiently; thus media of higher richness which can bring in social cues is preferred for formal tasks to casual tasks.

2.2.2. Task clarity

CM communication is particularly different from conventional communication such as face-to-face or telephone call for it allows anonymity. This function on the one hand allows

self-disclosure [20, 21]; on the other hand enhances self-awareness [22]. In other words, the SPT perspective could extend to presences other than text and voice, such as non-verbal symbols. The popularity of anonymity in CM communication hints that the abolishment of original social cues and the replacement of self-selected presences provide new comforts for communicators becoming more progressive in communicative engagement. Users are prone to express their thoughts and feedbacks. As a result, the quality of communication is improved.

Nevertheless, the replacement of original presences (anonymity) also turns the CM communication into hazards under certain circumstances. For instance, quarrels arise in forum or online chat room easily. The lack of original presences sometimes makes users more contentious. Consequently, users are easily becoming emotional. Compared to the face-to-face mode, CM communication may allow users becoming more sensational where they are more responsive to other user's actions.

That is to say, the adoption of CM media may change the chemistry of communication therefore user's communication behavior becomes aggressive compared to face-to-face communication. Fulk's earlier works [23, 24] about communication in organizational settings conclude three factors affecting communicational effectiveness; they are equivocality of the message, contextual determinants and symbolic cues. While the contextual determinants may remain similar for CM communication as for face-to-face one, the equivocality of messages may be amplified due to the reduction of symbolic cues in CM environment. For instance, when authority is decreased due to the removal of social cues within CM communication, vaguely defined issues may become provocative since involved ones face less stresses from ones of higher ranks in organization. On the other hand, if the issues are clearly defined, whether the communication is via CM media or not, involved ones can make their points more focused as a result more efficient in arriving conclusion. Thus I draw the second hypothesis as follows:

H2 (Clarity): When tasks are vaguely defined it may require more interaction to arrive conclusion hence media of higher richness increase adoption favoritism.

2.3. Familiarity with participants

Finally, irrespective of communication tasks, involved communication participants are obviously a factor affecting media favoritism for one may favor a medium over the others while communicating with a familiar person versus a stranger. To this end, Schmitz and Fulk [25] ask subjects to present their perceived media richness and social influences while using email as communication media to interact with his/her supervisor and five close communication participants. Their results show that users are presenting different assessment of media richness and the difference is covaried with the relational social influences of communication participants.

In addition, their later work [26] in investigation of the interactions with social agents influence technology-related cognitions and behaviors concludes that communication participant's attitudes and behaviors in using electronic mail predicts one's own attitudes and behaviors. Nevertheless, it is not clear in previous studies how factors affect the selection of media when communicate with ones of different associations, say colleagues, relatives or strangers. Among the three, since relatives are mostly familiar with each other therefore social presence may not be an issue here; instead, the cost associate with the media may be a concern[4] for selecting media. When the communications are among colleague or stranger high-cost media may be preferred since the bill is foot by the organization. Therefore, I draw the third hypothesis as follows:

H3 (Familiarity): Due to cost concern, high cost media are preferred in communication with

business participants such as colleagues or strangers to communication with relatives.

3. METHOD

3.1. Collaboration technologies

Attributed to the broad access of internet and the advantages collaboration technologies, five different options are widely available for CM communication nowadays as follows. Email is the earliest introduced CM medium. It replicates most functions of letter. Nevertheless, what it has achieved is far beyond conventional letter. Email is far less expensive than letter. The cost with it is usually ignored by users. In addition, e-mail can be adopted in multimedia format, such as audio and video effects, which may enrich communication environment and deliver superior communication quality [10].

IM (Instant Messaging) follows e-mail to be the second widely adopted CM medium. It is firstly introduced by American Online, Inc. Nowadays, all of the significant internet portals provide this medium such as Yahoo's Yahoo! Messenger, Microsoft's MSN Messenger. Interestingly, the company that serves the largest group of users is in China, the QQ, owned by Tencent. Obviously, the dirt cheap reason mitigates its popularity in China market.

VoIP (Voice over Internet Protocol) is foreseen as killer substitute for conventional telephone. This add-on device is similar to conventional telephone with digitalization capability of voice. The digitalized voice data packet is then sending out over internet. This technology was unsatisfactory in the era of dialup over telephone line. Since the introduction of ADSL and fiber cable, VoIP becomes the top choice for voice communication if cost is a concern, particularly for international calls.

Webcam begin as an add-on device which can be incorporated with instant messaging to send out instant image. It requires a low pixel digital camera to capture image and send out digitalized image data packet over internet. As the price of webcam drops sharply, it becomes

a standard device for regular notebook and tablet computers as well as mobile handsets.

Video conferencing was firstly introduced by AT&T in 1967 way ahead of internet. It relies on costly transmission via satellites thus hinders its penetration. It is a “luxurious” webcam where dedicated communication channel is chartered to avoid transmission lag. Besides, it allows seemingly integration of multiple engagements, a simulation of face-to-face meeting.

Accordingly, the technical attributes with respect to media richness, naturalness and cost were coded as follows (Table 1). The VoIP may be used as reference which is analogous to the regular phone calls allowing interactive conversations. Email and IM thus are leaner media that reduce social presence richness and naturalness. Webcam and video conferencing on the other hand provide greater social presence, naturalness and immediacy.

TABLE 1. Attributes of CM media

Media	Carrying	Richness	Naturalness	Cost
Email	Text (asynchronous)	Lean	Low	Low
IM	Text (instant)	Lean	Low	Low
VoIP	Voice (may lag)	Mid	Mid	Mid
Webcam	Text, voice & images (may lag)	Rich	High	High
Video Conferencing	Text, voice & Images (instant)	Rich	High	High

3.2. Experimental design

To test the hypotheses, a quasi-experiment of three-way factorial design was designed with three main effects: the familiarity with participants, the formality and clarity of communication tasks. User’s media favoritism was measured as dependent variable.

Formality factor is about the formality of communication issue and is set at two levels:

formal and casual. In the present study the formality is adopted particularly as for business purpose versus for casual purpose. Clarity factor is about whether the collaborative decision task to be made through the CM communication is clear or not and is set at two levels: clear and vague. Familiarity factor is about the relationship between communicators and is set at three levels: colleagues, relatives and strangers.

3.3. Experimental stimuli

The vignette for the quasi-experiment is comprised of two parts. Part 1 collects demographic information, including gender, education age, marriage status, job category and current job status. Part 2 asks users' favoritism attitudes regarding the five media for the experimental scenarios in Table 1.

Vignettes are designed to follow the three-way factorial design where the communicator's familiarity factor is set at three levels: with colleagues, with relatives and with strangers; it is a between-subject design, i.e., three different groups of subjects were hired to answer questions with respect to scenarios attributed to clarity and formality factors. The clarity and formality factors are both designed at two levels; it is a within-subject design, i.e., each subject was asked to rate their favoritism with respect to the five media for four scenarios (Table 2).

TABLE 2. Scenarios with respect to the three manipulation variables.

Clarity	clear		vague	
Formality	formal	casual	formal	casual
Familiarity				
with colleagues	annual budget meeting called by CEO	new year banquet preparatory meeting called by employee welfare	brainstorming in drawing creative proposal called by CEO	new product development meeting in search of product with high technology, multifunction and

		committee		low cost called by managers
with relatives	banquet preparatory meeting to celebrate an elder relative's 80 years old birthday	a gathering for mother's day gift purchasing	a gathering for matchmaking	a relaxant gathering of movie going and dinner
with strangers	attendance preparation for new product promotion campaign by unfamiliar company	a survey for auto driving satisfaction	HR manager interview	consulting visit by insurance agent for individual financial issues

3.4. Subjects

Experiment participants were hired from three sources including the employees of Taiwan subsidiaries of four foreign companies, employees of a well-known Taiwan company in computer industry and Executive MBA students of a private university in Taipei. These participants are hired for their acquaintance with CM media and the experimental stimuli.

4. RESULTS

4.1. Descriptive statistics of participants

450 vignettes were distributed composed one third for colleagues, another one third for relatives and the rest for strangers. The distribution of respondents is presented in Table 3 and the demographics in Table 4.

TABLE 3. Respondent profiles with respect to each between-subject control

	Distrib-	Res	Not	valid	Valid percentage
	uted	ponded	valid		(valid ones/distributed)
Colleagues	150	47	4	43	28.7%

Relatives	150	42	6	36	24.0%
Strangers	150	45	3	42	28.0%
Total	450	134	13	121	26.9%

TABLE 4. Demographics of samples

demographics	levels	Counts	%
Gender	mail	62	51.2
	female	59	48.8
Education	high school	9	7.4
	college	101	83.5
	graduate	11	9.1
Age	<25	19	15.7
	26-30	36	29.8
	31-35	35	28.9
	36-40	16	13.2
	41-50	15	12.4
	>50	0	0
Marriage	married	60	49.6
	single	61	50.4
Job	commerce	69	57
	engineer	20	16.5
	student	11	9.1
	others	21	17.4
Position	subordinates	104	86
	mid to high manager	16	13.2
	company owner	1	0.8

4.2. Split-plot ANOVA on media favoritism

Because this is a three-way factorial design, split-plot ANOVA is performed for analyses where the between-subject control is set on the relationship factor and within-subject is set on the formality and clarity factors. Table 5 presents the analysis results and the means with respect to each main effect are presented in Table 6.

TABLE 5. Split-plot ANOVA results.

Sources	df	Email		IM		VoIP		Webcam		Video conferencing	
		MS	F	MS	F	MS	F	MS	F	MS	F
Model	127	3.29	3.82***	4.80	4.90***	3.54	4.57***	2.98	3.80***	5.59	6.06***
Formality	1	0.69	0.8	30.91	31.6***	0.03	0.04	0.01	0.02	22.47	24.36***

Clarity	1	5.45	6.33**	0.32	0.33	0.44	0.56	8.28	10.57***	1.44	1.56
Familiarity	2	0.56	0.16	71.01	19.6***	7.16	1.96	16.67	6.04***	54.85	11.51***
F X C	1	2.53	2.94*	0.35	0.36	0.07	0.1	0.75	0.95	0.25	0.27
R X F	2	0.08	0.09	0.64	0.66	1.35	1.74	1.57	2.00	3.13	3.40**
R X C	2	1.32	1.54	3.40	3.48**	1.21	1.57	3.80	4.85***	3.50	3.79**
Residual	356	0.86		0.98		0.78		0.78		0.92	
Total	483	1.50		1.98		1.50		1.36		2.15	

Note: * represents 10% significance level; ** for 5%; *** for 1%. “F” stands for formality; “C” for clarity; “R” for familiarity.

TABLE 6. Means with respect to main effects

Independent variables	Manipulated levels	Email	IM	VoIP	Webcam	Video conferencing
Formality	Formal	3.92	3.02	3.14	2.83	2.94
	Casual	3.84	3.52	3.17	2.83	2.51
Clarity	Clear	3.98	3.31	3.13	2.70	2.67
	Vague	3.77	3.24	3.18	2.96	2.78
Familiarity	Colleagues	3.92	3.03	3.38	3.19	3.28
	Relatives	3.81	4.09	2.97	2.63	2.10
	Strangers	3.90	2.81	3.10	2.64	2.70

Note: Statistically significant main effects are presented in bold.

4.3. Task-formality effect

This main effect is significant for IM and video conferencing at 1% level. Subjects prefer using IM for casual issue ($\bar{x}=3.52$) to formal issue ($\bar{x}=3.02$). Nevertheless, the favoritism is reversed for video conferencing; the \bar{x} is 2.94 for formal issue and 2.51 for casual issue. That is, H1 hypothesis which states that “media of higher richness which can bring in social cues is preferred for formal tasks to casual tasks” is supported with video conferencing but not statistical significant for webcam. That is, the costly video conferencing which has dedicated chartered channel, immediate and high quality image, files and voice transmission

is recognized as a preferred medium for formal business communication.

4.4. Task-clarity effect

This main effect is significant for e-mail and webcam at 5% and 1% level respectively. Subjects prefer using e-mail for clear defined decision task ($\bar{x}=3.98$) to vague task ($\bar{x}=3.77$). Nevertheless, the favoritism is reversed again for webcam; the \bar{x} is 2.7 for clear defined decision task and 2.96 for vague issue. That is, H2 hypothesis which states “when tasks are vaguely defined it may require more interaction to arrive conclusion hence media of higher richness increase adoption favoritism” is supported with webcam and is not statistical significant for video conferencing. A possible reason for the insignificance may attribute to the high cost of video conferencing; video conferencing may only be adopted for business task irrespective it is clearly or vaguely defined. And webcam could be a less expensive substitute for clarifying a vague task.

4.5. Familiarity effect

This main effect is significant for IM, webcam and video conference call at 1% level. Subjects prefer using these media particularly with colleagues to with relatives and strangers. The three media are all capable of image transferring. In the webcam case, the means (\bar{x}) are 3.19 for colleague, 2.64 for stranger and 2.63 for relative. In the video conferencing, the means (\bar{x}) are 3.28 for colleague, 2.70 for stranger and 2.10 for relative. That is, H3 hypothesis which states “due to cost concern, high cost media are preferred in communication with business partners such as colleagues or strangers to communication with relatives” is supported with both the webcam and video conferencing.

4.6. Findings

Via this experiment, several interesting findings were observed as follows. Firstly, VoIP is

widely adopted as substitutes for telephone call where it appears no significance affects due to the three effects. That is, the three factors being considered in the present study are not affective. Besides, of the five examined technologies, email holds great margins of favoritism over other media. Particularly, the clarity effect for email ($F=6.33$, $p_value=.0123$) is significant at 5% level. It may imply that email is a vastly adopted communication medium day-in and day-out in organization.

Secondly, subjects show a great favoritism over IM in casual communication ($\bar{x}=3.52$ for casual task; $\bar{x}=3.02$ for formal task) and in communication with relatives ($\bar{x}=4.09$ for communication with relatives; $\bar{x}=3.03$ with colleagues and $\bar{x}=2.81$ with strangers). Besides, a significant interaction effect of clarity and relationship is observed. The means and standard deviation are shown in Table 7.

TABLE 7. Interaction effect $\bar{x} (\bar{s})$ of relationship and clarity factors for IM

Familiarity	Task clarity	
	Clear	Vague
Colleague	3.16 (1.34)	2.91 (1.27)
Relative	3.94 (1.28)	4.24 (1.19)
Stranger	2.90 (1.37)	2.71 (1.32)

Note. Standard deviations present in parentheses.

According to the interaction effect, IM is mostly welcome for communication among relatives for vague issues which are both in the sense of informality.

5. CONCLUSION

This study set out to investigate the task-media fit and the participants-media fit hypothesis

on collaboration technology favoritism. Experienced users were asked to evaluate their favoritism on the five CM collaboration technologies when they need to communicate with others for certain collaborative tasks. Overall, the results provide significant support for hypotheses.

Firstly, the hypothesis (H1) attributed to media richness and social presence in which addressing the communication task in terms of formal purposes versus casual purposes is supported with one of the high-richness media – video conferencing. That is, media of higher richness which can bring in more social cues is preferred for formal business tasks compared to casual tasks. In other word, the costly video conferencing which has dedicated chartered channel, immediate and high quality image, files and voice transmission is recognized as a preferred medium for formal business communication.

Secondly, the hypothesis (H2) attributed to media richness in which addressing the communication task in terms of clear goals versus vague goals is supported with one of the high-richness media – webcam. That is, if the collaboration goal is set vaguely, media of higher richness is preferred for capability of providing peripheral information to enhance communication. And a possible reason for the insignificance of video conferencing may attribute to the cost because a vaguely defined collaboration goal may not be justly achieved to justify the cost.

Finally, the hypothesis (H3) attributed to media cost in which addressing the communication participants in terms of colleague, relatives and stranger is supported with both high-richness collaboration technologies. That is, the high cost technology is justifiable for business partners; for communication with relatives, IM is preferred.

In addition, the IM medium provides some interesting findings. This medium induces different favoritism at significant levels with respect to the formality and familiarity factors. Firstly, subjects present high favoritism for casual tasks compared to formal tasks. Secondly, subjects like to use IM in communicating with relatives compared to business partners either

colleague or stranger. Both findings may imply that IM is widely utilized as communication tool for less serious purposes, that is, non-business issues and partners.

A managerial implication of the study may refer to the communication tools embedded in social networking sites, such as Facebook, QQ and so on. While email and IM are regular communication tools for those social networking sites to meet their demanding users in communication, online image transferring via webcam or video conferencing could differentiate in light of customer segmentations. According to the results, when communication is to collaborate on personal issues the lean media (such as IM) may serve user's needs, on the other hand, when is to collaborate on formal issues then the rich media (such as video conferencing) may fit needs better. Besides, due to the cost concern, rich media (video conferencing) is better justified for business usage. In other words, if web provides services with video conferencing, business users may vow to adopt for business communication and pay for the services.

Reference

1. To, P.-L., et al., *An empirical investigation of the factors affecting the adoption of Instant Messaging in organizations*. Computer Standards & Interfaces, 2008. **30**(3): p. 148-156
2. Cameron, A.F. and J. Webster, *Unintended consequences of emerging communication technologies: Instant Messaging in the workplace*. Computers in Human Behavior, 2005. **21**(1): p. 85-103.
3. Brown, S.A., A.R. Dennis, and V. Venkatesh, *Predicting collaboration technology use: Integrating technology adoption and collaboration research*. Journal of Management Information Systems, 2010. **27**(2): p. 9-54.
4. Reinsch, J., N.L. and R.W. Beswick, *Voice Mail Versus Conventional Channels: A Cost Minimization Analysis of Individuals' Preferences* Academy of

Management Journal, 1990. **33**(4): p. 801-816.

5. Short, J., B. Christie, and E. Williams, *The Social Psychology of Telecommunications* 1976: John Wiley & Sons Australia, Limited, .
6. Daft, R.L. and R.H. Lengel, *Organizational Information Requirements, Media Richness and Structural Design*. Management Science, 1986. **32**(5): p. 554-571
7. Dennis, A.R., R.M. Fuller, and J.S. Valacich, *Media, tasks, and communication processes: A theory of media synchronicity*. MIS Quarterly, 2008. **32**(3): p. 575-600.
8. Herring, S.C., *Two variants of an electronic message schema*, in *Computer-mediated communication: Linguistic, social and cross-cultural perspectives*, S.C. Herring, Editor 1996, John Benjamins: Amsterdam. p. 81-106.
9. Trevino, L.K., R.H. Lengel, and R.L. Daft, *Media Symbolism, Media Richness, and Media Choice in Organizations*. Communication Research, 1987. **14**(5): p. 553-574.
10. Sproull, L. and S. Kiesler, *Reducing Social Context Cues: Electronic Mail in Organizational Communication*. Management Science, 1986. **32**(11): p. 1492-1512.
11. Zhou, L., et al., *A Comparison of Classification Methods for Predicting Deception in Computer-Mediated Communication*. Journal of Management Information Systems, 2004. **20**: p. 139-165.
12. Burgoon, J.K., et al., *Testing the Interactivity Model: Communication Processes, Partner Assessments, and the Quality of Collaborative Work*. Journal of Management Information Systems, 1999. **16**: p. 33-56.
13. van den Hooff, B., J. Groot, and S. de Jonge, *Situational Influences on the Use*

of Communication Technologies: A Meta-Analysis and Exploratory Study.

Journal of Business Communication, 2005. **42**: p. 4-27.

14. Reinsch, J., N. Lamar, J.W. Turner, and C.H. Tinsley, *Multicommunicating: A practice whose time has come?* Academy of Management Review, 2008. **33**(2): p. 391-403.
15. Kock, N., *The Psychobiological Model: Towards a New Theory of Computer-Mediated Communication Based on Darwinian Evolution.* Organization Science, 2004. **15**(3): p. 327-348.
16. Mennecke, B.E., J.S. Valacich, and B.C. Wheeler, *The Effects of Media and Task on User Performance: A Test of the Task-Media Fit Hypothesis.* Group Decision and Negotiation, 2000. **9**(6): p. 507-529.
17. Hollingshead, A.B., J.E. McGrath, and K.M. O'Connor, *Group task performance and communication technology: A longitudinal study of computer-mediated versus face-to-face work groups.* Small Group Research, 1993. **24**(3): p. 307-333.
18. McGrath, J.E., et al., *Groups, tasks, and technology: The effects of experience and change.* Small Group Research, 1993. **24**(3): p. 406-420.
19. Chidambaram, L. and B. Jones, *Impact of Communication Medium and Computer Support on Group Perceptions and Performance: A Comparison of Face- to-Face and Dispersed Meetings.* MIS Quarterly, 1993. **17**(4): p. 465-491.
20. Kiesler, S., J. Siegel, and T.W. McGuire, *Social psychological aspects of computer-mediated communication.* American Psychologist, 1984. **39**(10): p. 1123-1134.
21. Siegel, J., et al., *Group processes in computer-mediated communication.* Organizational Behavior and Human Decision Processes, 1986. **37**(2): p.

157-187.

22. Matheson, K. and M.P. Zanna, *The impact of computer-mediated communication on self-awareness*. Computers in Human Behavior, 1988. **4**(3): p. 221-233.
23. Fulk, J., C.W. Steinfield, and J. Schmitz, *A social influence model of technology use*, in *Organizations and communication technology*, J. Fulk and C.W. Steinfield, Editors. 1990, Sage: Newbury Park: New York. p. 117-140.
24. Fulk, J., et al., *A Social Information Processing Model of Media Use in Organizations*. Communication Research, 1987. **14**(5): p. 529-552
25. Schmitz, J. and J. Fulk, *Organizational Colleagues, Media Richness, and Electronic Mail: A Test of the Social Influence Model of Technology Use* Communication Research, 1991. **18**(4).
26. Fulk, J., J. Schmitz, and D. Ryu, *Cognitive Elements in the Social Construction of Communication Technology*. Management Communication Quarterly, 1995. **8**(3): p. 259-288