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## **EXPLORING HOW CULTURE AND TASK NATURE AFFECT THE ADOPTION OF COMMUNICATION MEDIA**

**WING HAN BRENDA CHAN**  
UNIVERSITY OF MACAU

[brendac@umac.mo](mailto:brendac@umac.mo)

**U FAI CHAN**  
COMPANHIA DE ELECTRICIDADE DE MACAU

[gabriel.chan@cem-macau.com](mailto:gabriel.chan@cem-macau.com)

### **ABSTRACT**

The intent of this research is to study the interacting effect of culture and task nature on the adoption of communication media tools. The objectives are to suggest a comprehensive approach to the study of business communication media adoption with the consideration of cultural and task nature impact and to identify the best match of cultural characteristics and task nature with media choices so as to enhance business communication. Hypotheses were set up to test the interrelationships between independent variables (Hofstede's cultural dimensions and task nature) and the dependent variables (communication media). General Linear Model (GLM) analyses were carried out to analyze the survey data. Results of the empirical study suggest that: (1) individualism and familiarity with recipients suggest face-to-face communication; (2) uncertainties avoidances, task reciprocity, and task urgency have favor on telephone and video conferencing system; (3) high femininity people prefer telephone while high masculinity prefer instant messaging; (4) power distance index, work position, and task reciprocity suggest email and face-to-face communication; (5) when working on reciprocal tasks and recipients are far away, long-term orientated people prefer email or instant messaging while short-term orientated prefer face-to-face communication. The findings of the study provide useful insights into how business communication can be carried out so as to improve communication quality and in turn enhance productivity as a whole.

**Keywords:** communication media adoption, cultural dimensions, task nature

### **INTRODUCTION**

The choice of communication media plays a critical role to the effectiveness and efficiency of business communication and the productivity of businesses. Information Communication Technology (ICT) has enabled communication to be implemented in a cost-effective manner for at least participants need not to travel to a common place at a common time for the meeting [39]. However, when it comes to the discussion of

common media adoption in business projects, face-to-face (FTF) communication is considered to be one of the important members. This is because there is a need for trust and relationship development and partners may also need a more natural communication approach to express themselves [31]. Other common communication media choices include telephone, email, instant messaging (IM), and videoconferencing systems (VCS) [18]. It may, therefore, imply that there are situations that ICT may not be the ideal choice for certain communication and there are factors that affect the choice of communication media.

Treverton and Bikson [41] pointed out that around 70% of joint ventures fall short of expectation because of cultural differences and communication failures. A number of researchers have studied about cultural differences in communication and some of them also studied the influence of culture on media adoption [18, 30, 34]. Without understanding the cultural background and practice of one's business partners, it is difficult to select appropriate communication media and may even lead to less poor communication and in turn project failure [35]. This gives rise to this study of the impact of cultural background of the communication parties on the choice of communication media. Hofstede's cultural dimensions is the most commonly cited to examine culture [19, 20]. Other important theories that support the study of communication media choice include Media Richness Theory (MRT) [5], Social Influence Perspectives (SIP) [15, 16], Media Synchronicity Theory (MST) [8, 9, 10], Media Naturalness Theory (MNT) [24], and Media Fitness Theory (MFT) [18].

In addition, McGrath [30] has also pointed out that different communication tasks nature may influence the adoption of communication media. Different tasks to be implemented carry specific task requirements that determine the preference of communication media. McGrath's [30] communication task circumplex, the equivocality and uncertainty of task situations [5, 23] as well as a list of other task constrains [40] are necessary considerations for the adoption of communication media.

To address this issue of communication media choice, this research was designed with the following objectives:

- ♦ To suggest a comprehensive approach to the study of cultural and task nature impact on business communication media adoption; and
- ♦ To identify the best match of cultural characteristics and task nature with media choice so as to enhance business communication

## LITERATURE REVIEW

### Communication Theories

Various researches have studied and examined factors that influence the use of communication media. These factors have also brought about important theories in various research levels: Social influence perspectives (SIP) on social level; Media Richness Theory (MRT) on technology adoption level; and Media Naturalness Theory (MNT), Media Synchronicity Theory (MST), and Media Fitness Theory (MFT) on tasks requirement level.

Social influence perspectives (SIP) [15, 16] address that individuals' perceptions on media choice are influenced by peers. For example, when most people in a work group have preference on certain media, media preferences of the rest within the group might also be influenced.

Media Richness Theory (MRT) is one of the most commonly cited and widely known communication media theory proposed by Daft and Lengel [5]. It analyzes various media by their ability to information transmission (richness) in terms of 4 factors:

- ♦ Feedback capability — how quickly communication participants can react
- ♦ Availability of multiple cues — various communication channels available to the participants (e.g. physical presence, body language, and voice intonation)
- ♦ Language variety — the diversification of meaning that can be transmitted by language symbols (e.g., numbers can provide more precise and detail information while sentences can deliver more conceptual knowledge)
- ♦ Personal focus — the level of individual attention and personal feelings that the message contains

Lee [26] pointed out that the most effective media was face-to-face communication since it comprises of the above-mentioned four factors. However, one of the most remarkable shortcoming of MRT is that it was put forth before the development of the most recent electronic communication media innovations [11].

Media Naturalness Theory (MNT) [24] studies the naturalness of communication media and particularly e-communication media. MNT pointed out that e-communication tools are less natural in comparison to face-to-face communication.

Media Synchronicity Theory (MST) [9, 10] claimed that communication media should not be ranked on a linear scale from "poorest" to "richest". It suggested a list of media properties that affect communication process:

- ♦ Transmission velocity — the speed at which the information is transported from an individual to another
- ♦ Parallelism — the capability for multiple parallel communication sessions
- ♦ Symbol set — the diversity of symbols which allows information encoding. Natural symbols are vocal tones and physical gestures, etc.
- ♦ Rehearsability — the extent to which the message can be modified for better communication before sending out

- ♦ Reprocessability — the possibility to reprocess the transmitted message

MST proposes that the compatibility between the function of media and needs of the communication task determines communication effectiveness based on their familiarity and preference to the media, and would change over time. However, researchers in media choice have been arguing that MST or MNT might not be enough to bring out the whole picture for media choice. As a result, Media Fitness Theory was introduced.

Media Fitness Theory (MFT) was empirically proven to provide rather good match between the theoretical prediction of media selection and the actual choice [18]. The main difference between MFT and other mentioned theories is that MFT considered users/user groups and the communication tasks integrally when calculating the degree of media fitness. Moreover, environmental limitations are introduced to complete the framework as a whole. MFT defined the fitness of media by considering 12 properties and classifies them into three different groups (I, II, and III).

Properties in Group I are requirements for the media ability on information processing and transmission and are closely related to MRT and MST:

- ♦ Response time — after how long shall the communication get response? This is similar to the rapid feedback in MRT and the transmission velocity in MST. According to MFT's finding, the ranking order of response time capability of the five common media is  $Tel \approx FTF \approx VCS > IM > Email$
- ♦ Security — how information can be secured from unrelated parties. According to MFT's finding, the five media have similar security range
- ♦ Sharing — whether the exact information can be shared. According to MFT, the more a communication is personalized, the harder it is to convey the exact messages to any alternative recipient. Thus, the personalization presented by MRT can be seen as contradictory to sharing. MFT has further found out that the rank order of the five media on this aspect is  $FTF \approx Email \approx IM > Tel > VCS$
- ♦ Retrieval — how easily the information may be retrieved for later use. This is also related to rehearsability and reprocessability in MST. According to MFT, the rank order of the five media is  $Email > IM > VCS > Tel > FTF$
- ♦ Multiparty — the capability of a medium to support multi-user communications which is

similar as parallelism in MST. MFT has ranked the five media on multiparty capability as  $FTF \approx Email > IM > VCS > Tel$

- ♦ Expressive Power — the capability to deliver symbols. Four basic expressive powers are used by MFT (text, picture, voice and video). This is actually similar to the multiple cues and language variety in MRT and MNT, and the symbol sets in MST. In addition, text and picture are classified as non-natural symbol; voice and video as natural symbol and are also defined as personal presence in some studies [38]. According to MFT, the capability on delivering natural symbol for the five media are ranked as  $FTF > VCS > IM > Tel > Email$

Properties of Group II are closely related to SIP, with users and user groups as the focus for the study (e.g., the skill of using media, preference of media; and group lifespan). However, since all these are out of the consideration on media capability aspect, Group II properties are removed in this study.

Properties in Group III are the limitations bounded by the environment constrain:

- ♦ Availability — when and where the medium is available for use? This is very similar to the Media Accessibility from Kerr and Hiltz's study [22]. MFT has ranked this aspect for the five media as  $Tel > Email \approx IM \approx FTF > VCS$
- ♦ Bandwidth — the bandwidth requirement for communication media
- ♦ Cost — consists of both initial cost and the running cost for the communication media as well as the opportunity cost of the communication process. According to MFT, the rank order on cost from low to high is  $Email \approx IM > Tel > VCS > FTF$

## Hofstede's Cultural Dimensions

Individuals can be differentiated from a group or a category of people by understanding their culture [20]. To identify the cultural characteristics in the business environment and to allow better communication process with foreign partners, Hofstede's five cultural dimensions are adopted in this research. These dimensions include:

- ♦ Uncertainty avoidances (UAI) — the degree to which a person feels uncomfortable about facing expected, unfamiliar or ambiguous situations. The higher UAI, the more reliance on regulations to avoid changes

- ♦ Individualism (IDV) vs collectivism — the degree to which a person perceives oneself as a separate entity from the members of a group. The higher IDV, the more focus on personal interest
- ♦ Power Distance Index (PDI) — the extent to which a person believes, expects, and accepts how equally power should be distributed among members of a society, institution, or organization in the process of decision-making. The higher PDI, the more reliance on upper management in decision making
- ♦ Masculinity (MAS) vs Femininity — the level of assertiveness, aggression, confrontation, and differentiation in gender roles. The higher MAS, the more people seek for achievement on material success and emphasize on differentiated gender roles
- ♦ Long-term orientation (LTO) vs Short-term orientation — the level of importance a person places on relationship building despite slow results. Long-term orientation emphasis on future success rather than immediate rewards. On the other hand, short-term orientation prioritizes on maintaining traditions, personal stability, upholding social responsibility, and the give and take of favors and presents

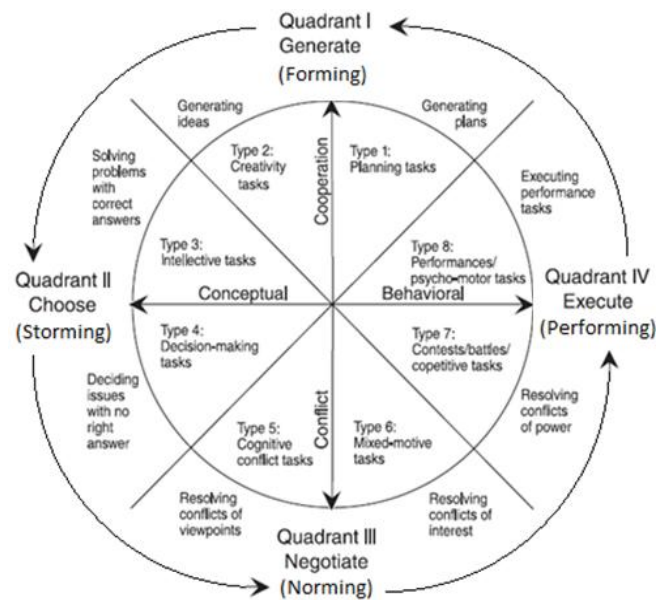


Figure 1: Task Circumplex [30]

Daft and Lengel [5] suggest the necessity of studying the various level of uncertainty and equivocality in task environment. Uncertainty exists when information to perform a certain task is not enough. Equivocality exists when there is confusion and a lack of common understanding. Acquiring more information is not enough but negotiation is required to reach a consensus on the interpretation. Daft and Lengel have proposed a conceptual framework for understanding and interpreting the concepts of uncertainty and equivocality, as shown in Table 1. In addition, El-Shinnawy and Markus [13] have suggested that the degree of uncertainty and equivocality affects a person’s choice of media. When equivocality is high, the situation is uncertain and ambiguous. This will require negotiation to resolve viewpoints or disagreement. When equivocality is low, the situation is certain and this will only require choosing right answer from the information on hand. This difference is very similar to the difference between judgment and decision-making task mentioned in the McGrath’s task circumplex [30], Quadrant II (Choose). In other words, the degree of conflicts (vertical dimension of the task circumplex) can be considered as reflected by the degree of task equivocality. However, even when equivocality level is low, uncertainty may still be an issue [32].

### Communication Task

As indicated in the above theories, the kind of communication tasks to be carried out is also a main driver to the choice of communication media. McGrath’s communication task circumplex [30] identifies the most commonly applicable communication task types: “Generate” refers to ideas creations; “Choose” refers to judgment and decision-making; “Negotiate” refers to resolving disagreements; and “Execute” refers to performing communications. Each quadrant in the taxonomy focuses on different task types and such representation of tasks further gives rise to two dimensions, with the horizontal dimension illustrating Behavioral versus Conceptual tasks, and vertical dimension illustrating the degree of Cooperation and Conflict (Figure 1). From previous studies about relationship building and communications [27, 44], the satisfaction level on communication is subject to the degree of Cooperation and Conflict. And the latter has detrimental impact on communication success. Thus, the primary interested of this study is on the dimension of Conflict vs Cooperation.

Table 1: Uncertainty and Equivocality [5]

	High Uncertainty	Low Uncertainty
High Equivocality	Not sure the situation and problem and lacking of information	Have a lot of information on hand but not sure the situation and problem.
Low Equivocality	Know the situation and problem and require more information.	Know the situation and problem and require few information only.

Researchers such as Daft and Lengel [5] and King and Xia [23] have also suggested that reciprocal communication tasks (e.g. exchanging confidential information or negotiation), which required higher personal presence on both communication parties, are usually taken place in equivocality situation. Table 2

summarizes some examples of reciprocal and non-reciprocal communication tasks cited from King and Xia [23]. Besides from the above task type identification, Straub and Karahanna [40] suggested that certain task constrains as shown in Table 3 are having influence on communication media choice.

Table 2: Reciprocal and Non-reciprocal Communication Tasks Example [23]

(Equivocality) Reciprocal Tasks	(Uncertainty) Non-reciprocal Tasks
<ul style="list-style-type: none"> <li>◆ Brainstorm / Clarify viewpoint</li> <li>◆ Exchange Confidential/Sensitive Information (e.g. Laid-off someone)</li> <li>◆ Promote/Explain</li> <li>◆ Negotiation / Resolve conflicts</li> </ul>	<ul style="list-style-type: none"> <li>◆ Exchange important information (Policies/Financial/Minutes)</li> <li>◆ Exchange Routine Information (Place order/ Report/ Schedule Meeting)</li> <li>◆ Stay in Touch (Personal / Social Activities)</li> </ul>

Table 3: Task Constrains which Influence Media Choice [40]

Task condition	Description
Urgency/Priority of Task	How urgent or prior is the task?
Recipient Availability	When the recipient is available?
Recipient Remoteness	How far is the recipient at the moment?
Familiarity with Recipient	How is your relationship with the recipient?

### Media Choices

In this study, five common media choices were selected based on their popularity in the business environment. This list of common media encompasses natural communication choice (face-to-face) as well as various electronic communication alternatives (telephone, email, Instant Messaging tools, and Video Conferencing Systems). It is interesting that although modern information communication technology (ICT) seems to be vital for business communication, face-to-face communication still plays a very importance role

particularly in situation when a strong sense of relationship and trust are to be emphasized.

- ◆ Face-To-Face (FTF) Interaction — a social interaction between individuals in the same physical location which is considered as the highest synchronous mode in human communication. However, in some situations where time and geographical distance are the issues, FTF will be less preferable [31]
- ◆ Telephone (Tel) — according to Chandler and Munday [2], telephone is the electronic device designated for voice communication over distance through a microphone by

converting sound vibrations into an electrical signal. In addition, invention of mobile phone has even further extended the flexibility of telephony. Telephone has been the most popular communication device throughout decades

- ♦ Email — also called Electronic mail, is a form of digital communication associated with the Internet. According to Danesi [7], email allows electronics transmission of textual message, graphic or even rich media attachments. With the advent of mobile devices, email can be accessible anywhere
- ♦ Instant Messaging (IM) – an interpersonal communication service that allows immediate response between two or more people via different connected devices through digital networks [7]. More advanced IM tools can even add files or process voice or video chat. Nowadays, IM services are available in both mobile devices and user base virtual communities. Popular IM tools include Facebook Messenger, Blackberry Messenger, Whatsapp, WeChat, QQ, Google+, and Skype
- ♦ Video Conferencing Systems (VCS) —VCS allows real-time visual and auditory communication between communicating parties in two or more locations. VCS is usually costly but technology advancements have enabled multiple party videoconferencing via web-based applications or even mobile devices [21]

## HYPOTHESES AND RESEARCH MODEL

### Hypotheses on Individualism vs Collectivism

Strong bonding and relationship between group members are important characteristics of the various aspects of collectivism [42]. According to Hofstede [20], people who rated high in collectivism value relationship building because they think that more efficient and trustworthy communication is a result of well-established relationship between the sender and the recipient. In other words, compare to individualistic people, collectivistic people are more willing to build relationship with unfamiliar recipient.

On the other hand, Balotsky and Christensen [1] also found that social personal presence, which consists of high degree of personal contact and natural expressions

from the sender (e.g. facial expression and voice), improve relationship building. In addition, according to Furner and George [17], social personal presence also considered how correct the information were shared and how many recipients could receive the information at the same time. This meant that when information were sent to the recipient correctly or were delivered to as much related people as possible at the same time, social personal presence could be improved. Among all the five media selected in this study, face-to-face communication has the best capability on all these aspects such as natural expression [25], correct information sharing, and multi-recipients and it is believed to be best for relationship building [18]. Therefore, it is hypothesized that

*H1a: Lower individualistic people (i.e. higher collectivism) have higher likelihood of adopting face-to-face (FTF) communication for business communication.*

*H1b: Individualistic people (higher IDV) with higher familiarity with recipients (higher FAM) have higher likelihood of adoption face-to-face (FTF) communication for business communication.*

### Hypotheses on Uncertainty Avoidance

For individuals of high degree of uncertainty avoidance, long feedback time could make them feel uncomfortable [17]. In general, under urgent situation, people usually seek rapid feedback. However, even the situation is not urgent, people who rated high in uncertainty avoidance are more likely to seek rapid feedback. Among the five media choices, telephone, face-to-face communication, and video conferencing systems offer quicker response time. It is speculated that people who rated high in uncertainty avoidance are more likely to choose telephone, face-to-face communication, and video conferencing. In addition, as comparing to telephone which is more likely to communicate only with voice, face-to-face and video conferencing systems have more personal presence as they can also transmit facial expression [18]. This is relatively beneficial for reciprocal tasks that focus on eliminating ambiguous or equivocal situation. Vice versa, telephone is more suitable on non-reciprocal tasks, which require less personal interaction. It is hypothesized that

*H2a: Under non-urgent situation (Low URG) and for reciprocal tasks (high RECI), higher uncertainty avoidance people (higher UAI) have higher likelihood of adopting face-to-face (FTF) communication for business communication.*

*H2b: Under non-urgent situation (Low URG) and for reciprocal task (high RECI), higher uncertainty avoidance people (higher UAI) have higher likelihood of adopting video conferencing systems (VCS) for business communication.*

*H2c: Under non-urgent situation (Low URG) and for non-reciprocal task (low RECI), higher uncertainty avoidance people (higher UAI) have higher likelihood of adopting telephone (TEL) for business communication.*

### **Hypothesis on Masculinity vs Femininity**

High femininity people focus on leisure time more than material success [20]. They prefer communicating through media that is most convenient, such as telephone which is available in most work places [18]. On the other hand, people who rated high in masculinity tend to focus more on performance and under the case that the recipient is not readily available in the same working place, they also have higher likelihood of using telephone as the recipient can be easily reached. Therefore, it is hypothesized that

*H3a: Femininity (lower MAS) have higher likelihood of adopting telephone (TEL) for business communication.*

*H3b: When recipient availability is low (low AVAI), masculinity (high MAS) have higher likelihood of adopting telephone (TEL) for business communication*

### **Hypothesis on Power Distance Index**

In general case, when dealing with reciprocal task, media with richer personal presence is more favorable to avoid ambiguous or equivocal situations [6]. However, people who rated high in power distance feel more stressful when they interact with those who work in higher-ranking position and tend to seek for media with better rehearsability and less personal presence to avoid making mistakes or letting recipients know their weaknesses [17], whereas people who rated low in power distance feel less stressful in the same situation [20]. As

email have the best rehearsability and limited personal presence [18], it is hypothesized that

*H4: For high reciprocity task (high RECI), high power distant people (high PDI) but lower in job position (lower POSITION) have higher likelihood of adopting email (EMAIL) for business communication.*

### **Hypothesis based on Long-term Orientation vs Short-term Orientation**

Short-term orientated people prioritize on maintaining traditions and personal stability, and tend to spend money on socialization. On the other hand, long-term orientated (LTO) people concerned more on cost-saving [20]. In high ambiguous or equivocality condition, face-to-face communication is believed to be the best choice among different media as it involves the richest personal contact with recipients and able to avoid or clarify possible misunderstandings [6]. However, if recipients are located far away, face-to-face communication will become relatively expensive in terms of cost for travelling or the opportunity cost for the use of time. In such case, email and instant messaging tools (IM) consume the lowest among the five media choices [18]. Therefore, it is hypothesized that

*H5a: When recipients are not nearby (high REMO) and are working on reciprocal tasks (high RECI), lower long-term oriented people (low LTO) have higher likelihood of adopting face-to-face (FTF) communication for business communication.*

*H5b: When recipients are not nearby (high REMO) and are working on reciprocal tasks (high RECI), higher long-term oriented people (high LTO) have higher likelihood of adopting email (EMAIL) for business communication.*

*H5c: When recipients are not nearby (high REMOs) and are working on reciprocal tasks (high RECI), higher long-term oriented people (high LTO) have higher likelihood of adopting instant messaging tools (IM) for business communication.*

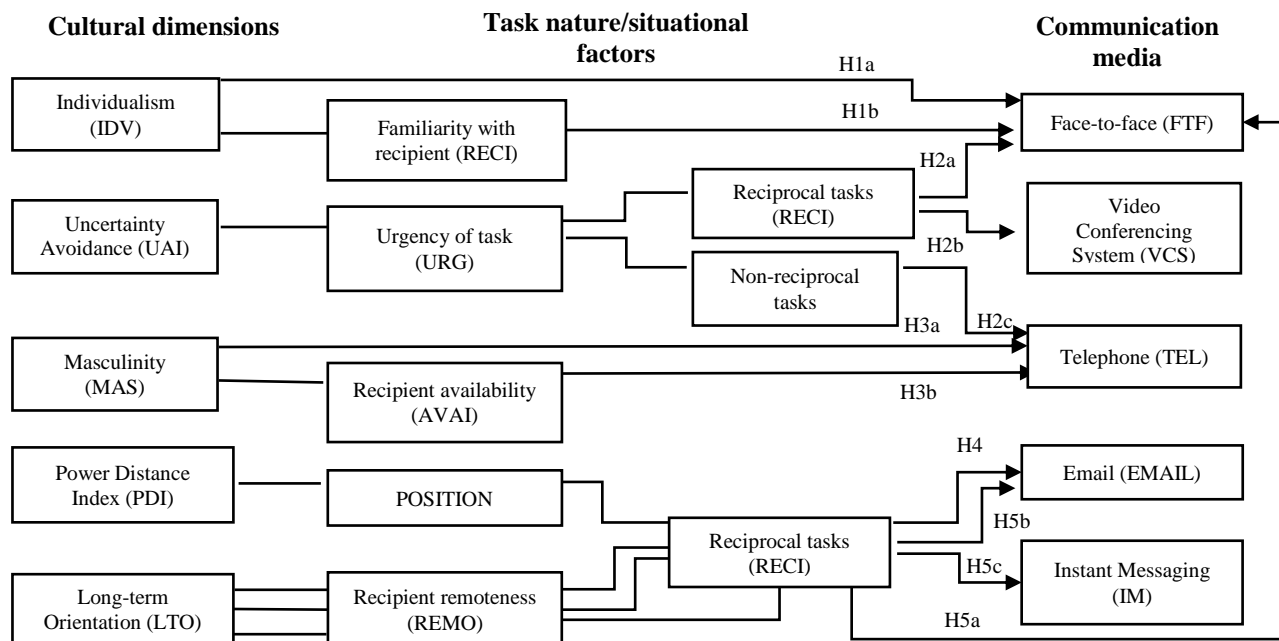


Figure 2: Research Concept Model

## METHODOLOGY

### Data Collection

The design of the questionnaire survey instrument is consistent with the theoretical model. To make sure that the items covered the content domain, due attention was paid to content validity. Additional items were also included in the survey instrument which were related to demographics. A pretest was administrated to further enhance the quality of the survey instrument. Two chief business executives and two IS professors participated in the pretest. They made many comments and the survey instrument was adjusted accordingly.

The finalized survey instrument was operationalized on 150 respondents who were selected randomly and with a requirement that they must have at least one year of working experience. Explanation on the

purpose of the survey was provided to ensure that respondents understand the survey and the questions. Table 4 shows the response rate of the questionnaire. Among 150 respondents, 135 have completed the survey. Seven of them were invalid due to missing data while 128 of them could be used. Demographic information of respondents is presented in Table 5. With the data collected, SPSS was employed to analyze the relationships between corresponding independent variables and dependent variables.

Table 4: Questionnaire Response Summary

Questionnaire	Total Sent	Returned	Invalid	Valid
QTY	150	135	7	128
%	100%	90%	4.67%	85.33%



Table 5: Respondents' Demographic Data Summary

Demographics		F	%
Gender	Male	63	49.2
	Female	65	50.8
	Total	128	100.0
Age	21-25	19	14.8
	26-30	41	32.0
	31-35	26	20.3
	36-40	14	10.9
	41-45	5	3.9
	46-50	11	8.6
	51-55	8	6.3
	56-60	2	1.6
	Above 60	2	1.6
	Total	128	100.0
Education Level	High School	14	10.9
	Diploma	13	10.2
	Bachelor	84	65.6
	Master	17	13.3
	Total	128	100.0
Position	Operation Level	69	53.9
	Managerial Level	22	17.2
	Executive Level	37	28.9
	Total	128	100.0
Work Experience	1 Year	5	3.9
	2-3 Years	26	20.3
	4-6 Years	24	18.8
	6 Years or above	73	57.0
	Total	128	100.0

Demographics		F	%
Industry	Government / Utility	61	47.7
	Production / Manufacturing	1	.8
	Hotel / Tourism / Gaming	31	24.2
	Financial	2	1.6
	IT / Telecom / Technology	13	10.2
	Engineering	3	2.3
	Logistics	1	.8
	Education	7	5.5
	Trading	1	.8
	Service	4	3.1
Department	Other	4	3.1
	Total	128	100.0
	HR	14	10.9
	Production	2	1.6
	Financial	9	7.0
	R and D	1	.8
	Marketing and Sales	13	10.2
	Operation and Service	49	38.3
	Executive	26	20.3
	Others	14	10.9
Total	128	100.0	

**Variables Reliability and Validity Analysis**

Cronbach's alpha coefficient was used to measure the reliability of the scale for each variable [33]. Table 6 shows the results of the reliability test generated from SPSS. Results shows that the five independent variables (cultural dimensions: IDV, UAI, MAS, PDI, LTO) are in

respectable level [12]. Moreover, since the dependent variables (FTF, VCS, TEL, EMAIL, and IM) were measured in different scenarios, the reliability is considerably high with Cronbach's Alpha coefficient over 0.9.

Table 6: Reliability Test Result of Independent Variables and Dependent Variables

Independent Variables	Cronbach's Alpha	No. of Items
IDV	.752	4
UAI	.854	5
MAS	.886	5
PDI	.823	5
LTO	.798	4

Dependent Variables	Cronbach's Alpha	No. of Items
FTF	.918	32
VCS	.966	32
TEL	.932	32
EMAIL	.925	32
IM	.953	32

On the other hand, factor analyses [45] were performed for testing the construct validity of independent variables. Results are listed in the Table 7. Since the dependent variables were measured in scenario-based tasks similar to that of Straub and Karahanna [40], while another part of the independent variables (i.e. Reciprocity

of task; Urgency of task; Familiarity with recipient; Remoteness of recipient, and Availability of recipient) were manipulated through wordings in different scenarios, according to Cooper and Richardson [3], the threat of validity due to such unequal comparisons could be eliminated.

Table 7: Factor Analysis Result for Independent Variables

	Component				
	1	2	3	4	5
MAS5_14	.868				
MAS3_12	.844				
MAS1_10	.813				
MAS2_11	.801				
MAS4_13	.727				
UAI5_09		.864			
UAI4_08		.797			
UAI2_06		.788			
UAI3_07		.713			
UAI1_05		.689			
PDI3_17			.831		
PDI2_16			.752		
PDI1_15			.740		
PDI5_19			.717		
PDI4_18			.700		
LTO1_20				.936	
LTO2_21				.786	
LTO4_23				.732	
LTO3_22				.626	
IDV2_02					.855
IDV1_01					.831
IDV4_04					.756
IDV3_03					.415

**Demographic Data Analysis**

Variance analysis was performed to explore the mean differences between various group of demographics and cultural dimensions (Table 8). Except IDV, all other

cultural dimensions have significant mean differences on demographic data such as education level, gender, and position. The implications of such impact will be discussed in later sections.

Table 8: Means and Variance Analyses of Demographic Data and Cultural Dimensions

Cultural Dimension	Overall Mean	Variance Test Significant Level						
		Gender	Industry	Department	Age	Education Level	Work Experience	Position
IDV	2.176	.296	.170	.501	.269	.180	.576	.914
UAI	4.344	.263	.316	.304	.241	.048	.211	.272
MAS	2.642	.001	.297	.929	.186	.409	.667	.350
PDI	2.134	.226	.716	.073	.474	.394	.963	.020
LTO	3.736	.533	.494	.935	.058	.622	.910	.513

**General Linear Model (GLM)**

Sharma et al. [37] has summarized a typology of different moderatings through the Moderated Regression Analysis (MRA) equation  $Y(i) = a + b(i)X(i) + c(i)Z(i) + dX(i)Z(i) + e Z(i)$ , which required testing on the interaction effects of different independent variables. GLM was adopted because it can produce a variances table and a parameter estimated table similar to regression for checking the relationship of the variables in terms of main effect of independent to dependent variables and also the interactions between variables to identify any moderation effect.

Usually, R-squared are valued between 0 and 1. The higher R-square is, the more the data are close to the

predicted value. However, in cases that are related to the prediction on human behavior, R-squared values are usually low as human behavior is usually harder to predict. Even when R-squared value is low, as long as there are statistically significant predictors, valuable conclusions can still be drawn [14, 28, 36]. Therefore, this study focused on the significant value ( $p < 0.05$ ) to identify the significant impact on the dependent variables.

Results in Table 9 using Multivariate GLM show the direct association between different cultural dimensions and task scenario on media adoption. In order to uncover every hypothesis in full picture, analyses on the interaction effects between variables were studied using Univariate GLM so that cases can be analyzed one by one.

Table 9: Variance Test and Parameter Estimates for Independent and Dependent Variables using Multivariate GLM

Variances Tests	Cultural Dimension					Task Scenario				
	IDV	UAI	MAS	PDI	LTO	RECI	URG	FAM	REMO	AVAI
FTF	.000	.922	.001	.026	.000	.000	.000	.000	.000	.000
VCS	.037	.004	.000	.001	.000	.000	.000	.024	.000	.023
TEL	.000	.000	.000	.133	.021	.000	.000	.000	.000	.079
EMAIL	.000	.000	.377	.000	.000	.000	.025	.000	.000	.936
IM	.065	.000	.000	.458	.003	.000	.000	.000	.000	.001
Parameter Estimates	FTF		VCS		TEL		EMAIL		IM	
	B	Sig.	B	Sig.	B	Sig.	B	Sig.	B	Sig.
IDV	-.255	.000	-.082	.015	-.158	.000	-.115	.001	.070	.049
UAI	.057	.153	.213	.000	.329	.000	.128	.002	.369	.000
MAS	-.042	.106	.084	.001	-.073	.003	-.001	.979	.125	.000
PDI	-.074	.016	.097	.001	-.043	.141	.122	.000	.026	.414
LTO	-.169	.000	-.268	.000	.078	.022	.235	.000	.110	.003
RECI	.833	.000	.228	.000	-.450	.000	-.653	.000	-.753	.000
URG	.587	.000	.311	.000	.165	.000	-.101	.022	-.299	.000
FAM	.331	.000	.095	.024	.456	.000	-.379	.000	.650	.000
REMO	-.507	.000	.158	.000	.236	.000	.165	.000	.360	.000
AVAI	-.305	.000	-.095	.023	.073	.079	-.004	.936	.156	.001
R <sup>2</sup>	.180		.049		.106		.100		.161	
Adjusted R <sup>2</sup>	.178		.047		.104		.097		.159	

**Analysis on Hypothesis 1– Impact of IDV and FAM on Media Choice**

Figure 3 shows the analysis result and the plotted graph for the testing of H1. According to the variances test table (Table 9), interaction effect of IDV\*FAM is not significant (p>0.05) while IDV and FAM are statistically

significant with FTF. The parameters estimated result shows that IDV has significant negative association with FTF while FAM has significant positive association (p<0.05). In such case both of them are predictor variables of FTF and supports both H1a and H1b. The graph plotted with the estimated result show the relationship.

Effect between IDV and FAM on FTF	Variances Test	Parameter Estimates	
	FTF		
	SIG.	B	Sig.
Intercept	.000	3.774	.000
IDV	.000	-.214	.000
FAM	.000	.333	.000
IDV * FAM	.736		
R <sup>2</sup>	.210		
Adjusted R <sup>2</sup>	.200		

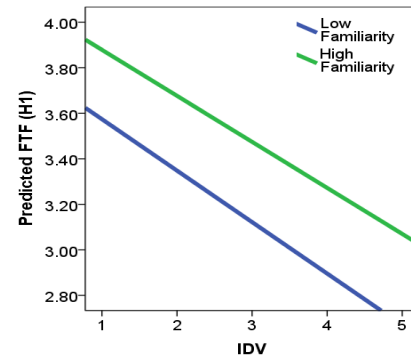


Figure 3: Predicted Likelihood of FTF vs IDV on FAM

**Analysis on Hypothesis 2 – Impact of UAI, URG, and RECI on Media Choice**

Figure 4 shows that URG and RECI have direct significant positive influence on FTF while UAI only have impact when interacting with URG and RECI together. Thus, H2a is not supported. UAI, RECI, and URG have significant positive association with VCS. H2b is supported. In addition, it is found that the interaction RECI\*URG have a significant negative impact on VCS.

According to the plotted graph, when both URG and RECI are high, the likelihood of VCS for higher UAI people is moderated and reduced. However, likelihood on FTF is still higher than using VCS for reciprocal task.

For TEL, except UAI\*RECI and UAI\*URG, all other effects are significant. With the estimated parameters, it is found that UAI and URG are positively associated with TEL while RECI is negatively influencing and this also suggests support for H2c.

Effect between UAI, URG, and RECI on FTF, VCS, and TEL	Variances Test	Parameter Estimates		Variances Test	Parameter Estimates		Variances Test	Parameter Estimates	
	FTF			VCS			TEL		
	SIG.	B	Sig.	SIG.	B	Sig.	SIG.	B	Sig.
Intercept	0.00	2.63	.000	0.00	1.25	.000	0.00	2.20	.000
UAI	.120			.002	.128	.000	.000	.356	.000
RECI	.000	.722	.000	.000	.386	.000	.000	-.269	.000
URG	.000	.476	.000	.000	.468	.000	.000	.340	.000
UAI * RECI * URG	.010	.051	.010	.000	-.073	.000	.000	.206	.010
RECI * URG	.713			.399			.000	-1.25	.000
UAI * RECI	.982			.981			.531		
UAI * URG	.735			.211			.120		
R <sup>2</sup>	.115			.026			.066		
Adjusted R <sup>2</sup>	.114			.025			.064		

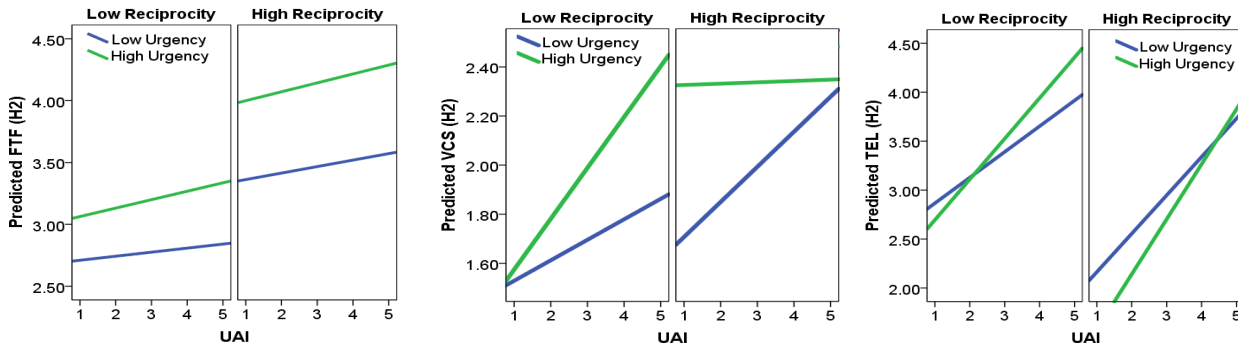


Figure 4: Predicted Likelihood of FTF, VCS, TEL vs UAI on URG and RECI

**Analysis on Hypothesis 3 – Impact of MAS and AVAI on Media Choice**

As shown in Figure 5, MAS has significant negative impact on TEL which means H3a is supported. Both AVAI and MAS\*AVAI do not have significant

impact on TEL. In addition, subgroup analysis was applied and that the R<sup>2</sup> in different groups were nearly the same. AVAI was not a homologizer which means AVAI do not have any significant direct or moderation effect on the relationship between TEL and MAS. H3b is not supported.

Effect between MAS and AVAI on TEL	Variances Test		Parameter Estimates	
	TEL			
	SIG.	B	Sig.	
Intercept	.000	3.827	.000	
MAS	.006	-.066	.006	
AVAI	.097	.073	.097	
MAS * AVAI	.777			
R <sup>2</sup>	.003			
Adjusted R <sup>2</sup>	.002			
Subgroup Test	R <sup>2</sup>	Adjusted R <sup>2</sup>		
Low Availability	.002	.002		
High Availability	.001	.001		

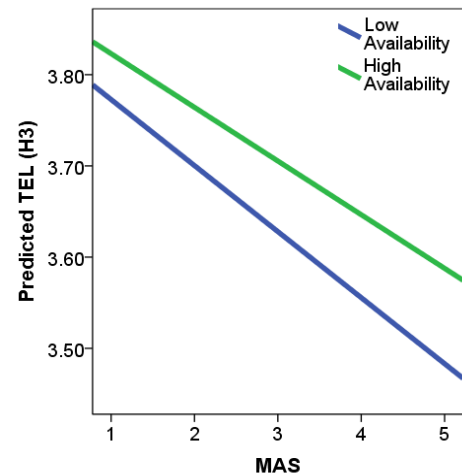


Figure 5: Predicted Likelihood of TEL vs MAS on Avai

**Analysis on Hypothesis 4 – Impact of PDI, RECI and Position on Media Choice**

Different from other hypotheses, demographic data (POSITION) was put into consideration and is found that POSITION is strongly related to PDI. According to Figure 6, all 3 independent variables are directly associated

with EMAIL while PDI\*POSITION has a significant interaction. Both PDI and POSITION are having positive impact with EMAIL while RECI and PDI\*POSITION are having negative impact. In the plotted graph, when POSITION is low and PDI is high, it moderated the likelihood of EMAIL to be higher and particularly in high reciprocal situation. H4 is supported.

Effect between PDI, RECI, and POSITION on EMAIL	Variiances Test	Parameter Estimates	
	SIG.	B	Sig.
Intercept	.000	3.345	.000
PDI	.000	.164	.027
POSITION	.023	.408	.000
RECI	.000	-.655	.000
PDI * POSITION * RECI	.358		
PDI * POSITION	.000	-.160	.000
PDI * RECI	.771		
Position * RECI	.657		
R <sup>2</sup>		.058	
Adjusted R <sup>2</sup>		.057	

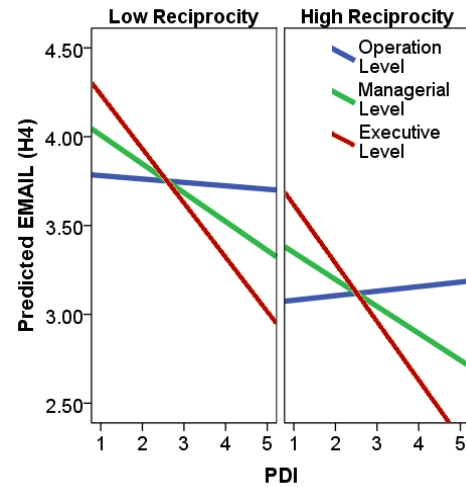


Figure 6: Predicted Likelihood of EMAIL vs PDI on Position and RECI

However, what communication media are preferable for people who rated low in PDI and in lower POSITION? Results in Table 9 have also shown that PDI has a negative impact on FTF communication. When PDI is low, the likelihood on FTF is higher. A post-hoc test with GLM analysis was conducted for further checking the impact of PDI, position, and RECI on FTF. It shows that

for lower PDI people, when RECI is high, lower position people have resulted in higher likelihood on FTF. However, when RECI is low, POSITION will moderate the likelihood on FTF. For low PDI, it results in higher likelihood on FTF when POSITION is low; while high PDI results in higher likelihood on FTF when POSITION is high (Figure 7).

Effect between PDI, RECI, and POSITION on FTF (Pro-hoc test)	Variiances Test	Parameter Estimates	
	SIG.	B	Sig.
Intercept	.000	4.272	.000
PDI	.000	-.498	.000
POSITION	.569	-.185	.569
RECI	.000	-.608	.000
PDI * POSITION * RECI	.000	-.259	.000
PDI * POSITION	.000	.234	.000
PDI * RECI	.001	.479	.001
Position * RECI	.001	.575	.001
R <sup>2</sup>		.082	
Adjusted R <sup>2</sup>		.081	

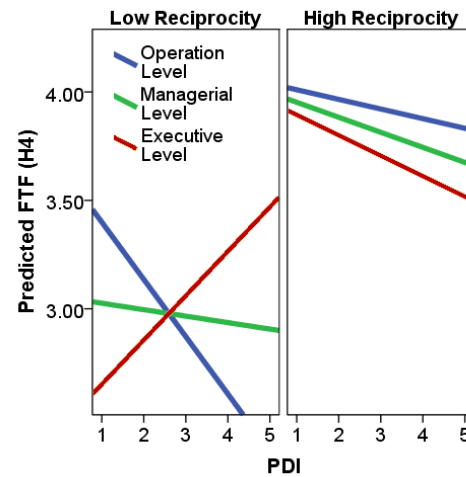


Figure 7: Predicted Likelihood of FTF vs PDI on Position and RECI

**Analysis on Hypothesis 5 – Impact of LTO, REMO, and RECI on Media Choice**

In the case of FTF, all variables that have interactions with LTO shows no significance. REMO has significant negative impact on FTF while RECI has significant positive impact. This supports H5a. RECI, and REMO show negative association with EMAIL but LTO positive. The interactions LTO\*RECI\*REMO and LTO\*RECI show significant positive association with

EMAIL as well. RECI and REMO are both quasi moderator on this relationship. By studying the plotted graph (Figure 8), as in high RECI task, when REMO is high, higher LTO presents higher likelihood on using Email. H5b is supported. For IM, RECI shows a negative association while LTO positive. REMO and the interaction LTO\*RECI\*REMO are having positive association with IM. For high RECI task, when REMO is high, people rated higher in LTO have higher likelihood on using IM. Thus, H5c is also supported.

Effect between LTO,REMO, RECI on FTF, VCS and TEL	Variances Test	Parameter Estimates		Variances Test	Parameter Estimates		Variances Test	Parameter Estimates	
	FTF			EMAIL			IM		
	SIG.	B	Sig.	SIG.	B	Sig.	SIG.	B	Sig.
Intercept	.000	3.624	.000	.000	3.111	.000	.000	2.404	.000
LTO	.011	-.084	.011	.000	.200	.000	.000	.229	.000
RECI	.000	.838	.000	.000	-1.479	.000	.000	-.856	.000
REMO	.000	-.510	.000	.000	-.145	.019	.000	.254	.000
LTO*RECI*REMO	.307			.000	.166	.000	.019	.056	.019
LTO *REMO	.484			.781			.434		
LTO *RECI	.782			.038	.137	.039	.436		
RECI *REMO	.280			.475			.876		
R <sup>2</sup>	.106			.087			.084		
Adjusted R <sup>2</sup>	.105			.086			.083		

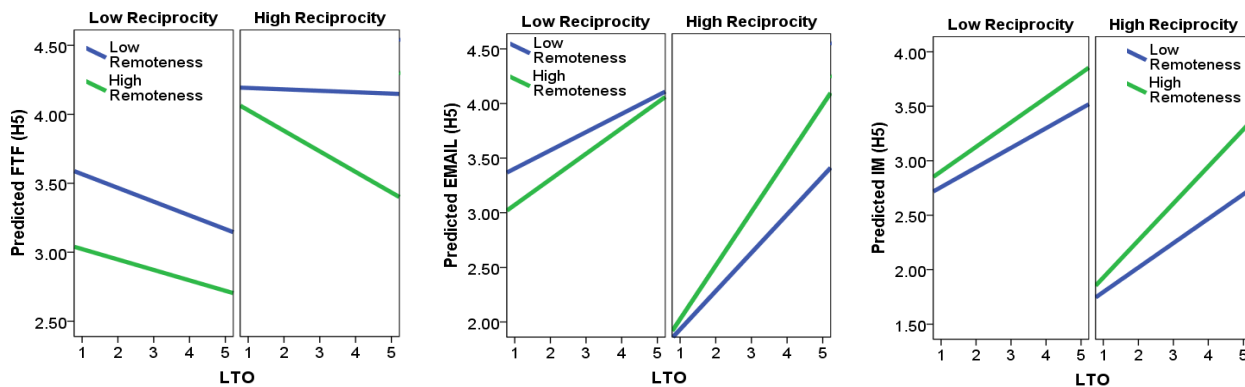


Figure 8: Predicted Likelihood of FTF, EMAIL, and IM vs LTO on Remo and RECI

## DISCUSSION

Table 10: Hypothesis Result Summary

Hypothesis	Results	Findings /Remarks
H1a	Supported	IDV has negative association with FTF
H1b	Supported	FAM has positive association with FTF
H2a	Not Supported	UAI have no significant association with FTF but URG and RECI have positive association
H2b	Supported	UAI, RECI and URG have significant association with VCS but when all 3 are high, the association with VCS is moderated and lowered
H2c	Supported	UAI, RECI, and URG present positive association with TEL
H3a	Supported	MAS has a negative association with TEL
H3b	Not Supported	AVAI has no effect on TEL
H4a	Supported:	RECI has a negative association with EMAIL while PDI and POSITION present positive association. POSITON acts a moderator that lowers the impact of PDI on EMAIL
H5a	Supported	LTO and REMO show negative association with FTF while RECI shows positive. In the case of high REMO and high RECI, low LTO increases the impact on FTF
H5b	Supported:	RECI and REMO have negative association with EMAIL while LTO positive. REMO is not significant for EMAIL. Under high RECI, low LTO results in low EMAIL adoption while high LTO results in high EMAIL adoption
H5c	Supported	RECI has negative association with IM while LTO and REMO have positive association. In the case of high REMO and high RECI, higher LTO results in higher IM adoption

Table 10 summarizes the results of the hypothesis testing. Collectivistic people value relationship building more than individualistic people [20]. The degree of correctness in information sharing and the ability to support multi-user communication can influence relationship building. Among the media choices, face-to-face rated best on all aspects and is favorable for relationship development. Collectivism people should adopt face-to-face communication than individualism. This coincides with the idea of Triandis et al. [42]. Moreover, it is also found that the degree of familiarity with recipients helps raising the preference for face-to-face communication. When one would like to better establish a relationship with known recipients, face-to-face communication offers the opportunity to communication

parties to meet and share in the most natural way [25]. For the case of communicating with unfamiliar recipients, face-to-face would not be the best choice for individualistic people.

Remoteness and availability of recipients have negative association with face-to-face. Explanation to this finding is that although people who tend to avoid uncertainty may value rapid feedback so as to reduce anxiety and uneasiness from incomplete information, face-to-face communication is often not their preference because there is often the chance that recipients are far from the sender's workplace or not readily available in office. This could be one of the reasons why face-to-face communication has no significant impact with uncertainty



avoidance especially when remoteness and availability of recipients are considered.

Based on this study, education level has negative association with uncertainty avoidance. People of lower education level have higher uncertainty avoidance. According to Hofstede [20], high in uncertainty avoidance will rely more on regulations and avoid changes which also imply that people may not be flexible enough to carry out communication in less structural settings and to deal with unexpected changes in their work environment. In such case, it is suggested that managers should prepare regulations and guidelines to support employees in dealing with less structural communication. For example, managers should deliver standards and procedures for urgent cases and/or assign trained personnel to handle urgent cases.

Lower PDI people believe that people are equal and have less hierarchical concern in their working environment [20]. They feel less anxious and intimidating when interacting with their seniors and would more likely share their feelings with them; they worry less about showing their mistakes and weaknesses; they prefer higher social personal presence. In the case of implementing high reciprocal tasks, face-to-face is the best choice. This is supported in Figure 7.

According to the survey when dealing with reciprocal task yet recipients are far away from the sender, people of stronger long-term orientation show better preference on email and instant messaging tools while those of stronger short-term orientation, who are less sensitive to communication cost, preferred face-to-face communication. This is the situation as explained by Higa and Gu [18]. The cost (travelling and time consumption) for face-to-face is the main concern for communication parties and, thus, long-term oriented people, who are more concerned for cost-saving [20] prefer less costly communication media (email and instant messaging). Based on this finding, it is suggested that when dealing with clients or business partners in a transaction relationship, face-to-face communication can be considered.

Position, the ranking of a person in a business, has positive association with power distance index (PDI). For people at a higher position, his PDI is higher. According to this result and in the case of implementing a low reciprocal task, position and PDI do moderate the likelihood on email adoption. For people who rated higher PDI but working at lower job position, email is more preferable as they can better prepare their content of communication to avoid making mistakes and avoid letting recipients know their weakness. However, for people who are high in both position and PDI, their likelihood of choosing email will be lower (Figure 6). Email allows rehearsability and in turn

creates digital records throughout the communication process. For strategic, long-term relationship, alternative choices of communication media that can still provide high personal presence yet lower cost are email and instant messaging. And among these two choices, email is comparatively better since email is more structured and allows communication parties to track and manage shared information more effectively and efficiently. This abilities of email in structuring digital communication and creating digital records are the key reasons that support its popularity in the business environment.

According to Table 9, only instant messaging is positively associated with individualism. To verify this result, short interviews were carried out with people who have strong preference with IM. They reflected that IM is more convenient as compared to other ICT such as email, telephone or VCS. They explained that the best of IM is that participants have the choices on how they could conduct the communication, i.e., through text, audio, video, or emotional icons, anytime, anywhere. Prior research have also identified the benefits of IM, including the ability of knowing the availability of personal contacts, access to nearly instantaneous communication, and the ability to conduct several informal conversations simultaneously, etc. [4]. According to Hofstede [20], femininity seek for leisure while masculinity focus on material success. It is found that masculinity who seek for greater level of control and power has no significance on telephone, but on IM. At the same time, recipient availability also has positive association with IM. This can be interpreted that IM offers a good choice of communication features. It is convenient and instantaneous. Masculinity can have all their needed control throughout the communication process as well as the content.

However, managers should also be aware of the negative aspects of IM — incoming notifications bringing about disruption to the working place and in turn affects worker productivity; and the issues of privacy and security are also important concern. Managers should set up regulations and control for the ethical use of IM in the working place so as to grasp the benefits without sacrificing business interests.

Femininity prefers convenience [18] and their choice of telephone communication is proven in this research. Telephone communication involves less personal interaction, i.e., with only voice transmission, is expected to be more suitable for non-reciprocal task. For implementing non-urgent and high reciprocal task, high uncertainty avoidance people should adopt telephone. People who rated high on uncertainty avoidance highly value rapid feedback on communication, especially in urgent cases. The longer they have to wait for the reply, the

more uncomfortable they are [17]. The finding in this research suggests the solution with telephone, video conference system, and face-to-face rated best in terms of response time. With regard to the reciprocity of tasks, it is also shown that face-to-face communication and video conferencing system, which involve stronger personal interaction, are more suitable. With the consideration of the urgency and the reciprocity of tasks, high uncertainty avoidance people are more likely to communicate face-to-face or use VCS. One main concern for the adoption of VCS is that it requires communication parties to be equipped with the needed systems and the preparation cost for such is, among the five communication media choice, the highest. That is also why VCS is the least popular among the choices.

### Limitations and Future Studies

First, a larger survey population would be more ideal to ensure the representativeness and validity of the data. Next, further studies on the moderating roles of demographic variables, such as gender, age, and industries, etc. with cultural dimension variables and media choices may also bring about interesting findings. Lastly, Instant Messaging, as in this research finding, is the only media choice that has significant impacts with most of the cultural dimensions. Instant Messaging with its growing popularity and preference in business communication is worth further studying.

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## **AUTHOR BIOGRAPHIES**

**Wing Han Brenda Chan** is assistant professor of the Department of Accounting and Information Management at the University of Macau. Her research and publications focus on IS management, IS project management, and IT outsourcing management

**U Fai Chan** is an engineer of the Department of Network Planning, Design, and Construction at Companhia de Electricidade de Macau.