

Elsevier Editorial System(tm) for Computers in Human Behavior

Manuscript Draft

Manuscript Number:

Title: Re-Testing Media Richness Theory in Messaging Media Environment: A Cross-Cultural Comparison

Article Type: Full Length Article

Section/Category:

Keywords: Instant Messaging (IM), Short Messaging Service (SMS), Information and Communication Technology (ICT), media richness theory, cross-cultural comparison

Corresponding Author: Dr. Zixiu Guo, PhD

Corresponding Author's Institution: University of New South Wales

First Author: Zixiu Guo, PhD

Order of Authors: Zixiu Guo, PhD; Tim Turner, Master; Huizhong Xu, Master

Manuscript Region of Origin:

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higher preference for email than their Chinese counterparts and Australian students also perceive IM and SMS as leaner in terms of media richness and have less preference for these media than their Chinese counterparts. Australian students prefer email in a manner similar to the telephone, while Chinese students perceive messaging media significantly different from traditional media.

THE UNIVERSITY OF
NEW SOUTH WALES



SCHOOL OF INFORMATION SYSTEMS,
TECHNOLOGY AND MANAGEMENT

Dr. ZIXIU GUO

Robert D. Tennyson,
Department of Educational Psychology,
University of Minnesota, Minneapolis,
USA

Dear Professor Tennyson,

We would like to submit our paper titled as “Re-Testing Media Richness Theory in Messaging Media Environment: A Cross-Cultural Comparison” to *Computers in Human Behavior* for being considered for publication. This paper has not been submitted to anywhere for review. All authors agree to submit this paper to the journal of *Computers in Human Behavior*.

Thank you for your consideration. We are looking forward to hearing from you.

Sincerely yours,

Zixiu Guo

SYDNEY 2052 AUSTRALIA
Email: z.guo@unsw.edu.au
Facsimile: +61 (2) 9662 4061
Telephone: +61 (2) 9385 7174

Re-Testing Media Richness Theory in Messaging Media Environment: A Cross-Cultural Comparison

Zixiu Guo*

z.guo@unsw.edu.au

Tel: 61 2 9385 7174, Fax: 61 2 9662 4061

School of Information Systems, Technology and Management,
The University of New South Wales, Sydney, Australia

Tim Turner

School of Information Technology and Electrical Engineering,
Australian Defence Force Academy,
The University of New South Wales, Canberra, Australia

Huizhong Xu

School of Management,
Fudan University, Shanghai, China

Re-Testing Media Richness Theory in Messaging Media Environment: A Cross-Cultural Comparison

Abstract

This study empirically examines the general propositions of media richness theory using newer and increasing popular messaging media, Instant Messaging (IM) and Short Messaging Service (SMS), in two distinct cultural contexts, Australia and China. The overall results of this study support some aspects of media richness theory. Media richness is rated in decreasing order of face-to-face, telephone, IM, email and SMS. When task equivocality increases, richer media (face-to-face and telephone) are perceived to be more effective, while email becomes more popular when task equivocality decreases. Although IM is perceived to be richer than email, it is not perceived to be the most popular medium for any situation. Perception of SMS is marginally consistent with what media richness theory predicted. Data also demonstrate cultural differences in media perception of and preference for new media. Specifically, Australian students have higher preference for email than their Chinese counterparts and Australian students also perceive IM and SMS as leaner in terms of media richness and have less preference for these media than their Chinese counterparts. Australian students prefer email in a manner similar to the telephone, while Chinese students perceive messaging media significantly different from traditional media.

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Introduction

The rapid development and diffusion of new information and communication technologies (ICTs) have offered people more options than ever before for communicating in organizational contexts and daily life. Among these new communication media, email, Instant Messaging (IM), and text messaging in the form of SMS (Short Messaging Service) are three electronic messaging media with different forms of interactivity (synchronous vs. asynchronous) and delivered over different electronic channels (over Internet vs. mobile telephone networks). Although IM and SMS have been widely adopted both in workplace and personal interaction recently (Hung, Kong, Chua and Hull, 2006; Patton, 2003; Segerstad and Ljungstrand, 2002), due to their relative novelty as communication media, academic interest in IM and SMS is only recent and fairly scattered (Cameron and Webster, 2005; Hung et al., 2006; Nardi, Whittaker and Bradner, 2000; Rennecker, Dennis and Hansen, 2006; Segerstad and Ljungstrand, 2002). Research to date has focused primarily on understanding and describing how and when IM and SMS are used and adopted. However, many of these studies did not draw from a theoretical base (except some notable exceptions, e.g. Cameron et al 2005 and Nardi et al 2000). Furthermore, these studies have studied IM or SMS in isolation. As Rice (1993) noted, use of any one technology should be considered in light of the repertoire of other media available to fully understand when, why, and how any single medium is used. The study reported here contributes to the efforts to examine students' behaviors and their views of when they adopt IM and SMS and how they perceive and choose these two media, in conjunction with other media (face-to-face, telephone, and email), in their university

learning activities. As two new popular media, IM and SMS are adopted widely by young generations (Grinter and Palen, 2002; Nysveen and Pedersen, 2002). Thus, understanding how students are using the IM and SMS media is of importance for a rigorous examination of the new information technologies' development, use and social effects (Flanagin, 2001). Also, today's university students can be expected to be tomorrow's business executives and they will carry their perceptions of media with them into the workplace.

Media richness theory, based on the medium-task fit framework (Daft and Lengel, 1984; Goodhue and Thompson, 1995; Short, Williams and Christie, 1976), is one of the first predominant prescriptive theories to describe how and why people choose a particular medium to communicate with others in the workplace. Media richness theory argues that task performance will be improved when task needs are matched to a medium's richness—"the ability of [its] information to change understanding within a time interval (Daft and Lengel, 1986b, p.560). Although the empirical tests of media richness theory are not very supportive, especially for "new media", such as computer-mediated communication (CMC) media, and although other social factors have been identified to explain the accumulating body of anomalous findings in media richness theory, media richness theory is still one of the most widely known and used prescriptive theories (Cameron and Webster, 2005; Carlson and Zmud, 1999; Dennis and Kinney, 1998; Ferry, Kydd and Sawyer, 2001; Hung et al., 2006; Kahai and Cooper, 2003; Kraut, Rice, Cool and Fish, 1998; Roberts, Lowry, Cheney and Hightower, 2006; Straub and Karahanna, 1998; Trevino, Webster and Stein, 2000). This is because both rational (in this regard, media richness

theory) and social explanations of media choice are complementary, not exclusive (Trevino et al., 2000). Each of these factors may only explain a small amount of variance in media use (Rice and Webster, 2002). Webster and Trevino (1995) found that some factors were clearly more important for some media than other factors. For example, message equivocality was most important for face-to-face meetings, and social influences were more important for new media than for traditional media. Some recent studies have showed that media richness is one of the factors to improve group communication outcomes (Hung et al., 2006; Roberts et al., 2006; Zhang, Lowry, Fu, Zhou and Adipat, 2006). Thus, although media richness theory is discounted today (Lee, 1994) and should no longer be the predominate factor in selecting a communication medium, it is still important to study this theory when examining how and why people select media for communication. As two newer ICT-mediated communication media, IM and SMS have not been included, along with other media, in testing media richness theory. The main objective of this study is to empirically examine the general propositions of this theory using new messaging media, along with other media.

This study also attempts to shed light on how cross-cultural difference may have impact on media richness theory. Previous research shows that culture has a significant impact on the way people communicate with each other (Earley, 1993; Gudykunst, Matsumoto and Ting-Toomey, 1996; Singelis and Brown, 1995). Each culture has more or less different ways of doing business and a more or less different set of values to guide human behavior (Tan, Watson and Wei, 1995). Theories and research findings that apply in one culture need not necessarily apply in another

(Boyacigiller and Adler, 1991). Thus, understanding of how national culture influences university students' perceptions of and preferences for media appears to have significant implications in culturally heterogeneous university group interactions; a common phenomenon in any Australian and many US universities. As these media become widely adopted, their importance to the general users in professional and workplace contexts is also significant.

Specifically, this paper describes a field study examining how university students perceive and prefer five available media: face-to-face, telephone, email, IM and SMS, in their learning and group collaborations in two distinct countries: Australia and the People's Republic of China. This paper firstly explores the various functions of electronic messaging media. Secondly, the literature describing media richness theory is outlined. The concept of national culture and its relationship with communication media are discussed next. Hypotheses testing media richness theory and cultural impact on media choice are generated after each section. Then research method and the results of the data analysis are presented. Finally, the paper concludes with a discussion of the implications of the findings in terms of the new media environment.

Text-Based Electronic Messaging Media

Email, a computer-based messaging system, is asynchronous and text-based, and allows written messages to be composed and edited on a computer screen and then sent either to an individual or to a pre-defined list of recipients (Rice and Webster, 2002). It does not need confirmation of the receiver's presence at the time of

sending. Although it can be instantly transmitted, it is frequently stored for later attention. In fact, feedback is not guaranteed. Email communication shares many features of traditional written communication: it is indeed written using the same graphic system and monomodality as traditional writing. The ease of access for sending messaging is considerably greater. As a specific CMC system, email has changed the way people keep in touch and the way business is done. It has become an integral component of the corporate culture in many organizations (McManus, Snankar and Ford, 2002).

Instant Messaging (IM) refers to Internet-based synchronous text chat, with one-to-one or small group communication among users on the same system. IM systems of various forms have gained high popularity during the past few years, particularly by young people. Commercial instant messaging systems such as AOL Instant Messenger, Yahoo Messenger, and Microsoft MSN Messenger have attracted millions of daily users in recent years (Segerstad and Ljungstrand, 2002). IM distinguishes itself from previous text messaging technologies by the predominance of users messaging with known others. A Chinese version called QQ, which is predominant with Chinese youth, has similar functions. IM uses a near-synchronous (cf. Ferrara, Burnner and Whittemore, 1991) conversational tool by which the participants know that other participants are presently logged on, even though they are not located face-to-face and unable to take advantage of the multimodality that face-to-face communication allows. Thus, the time delay is much less compared to email interaction and the message will be read within seconds, in this regard coming closer to spoken communication. The interaction is characterized as near-synchronous since the

messages have to be typed first and then transmitted, whereas telephone and face-to-face interaction are fully synchronous modes of communicating (Segerstad and Ljungstrand, 2002). The younger generation has already adopted IM (Grinter and Palen, 2002; Leung, 2001). But, IM is no longer just a facet of teenage life, it now speeds everything from naval operations to customer service (Cherry, 2002). According to a survey by Osterman Research, a technology research company, almost half of all U.S. and Canadian companies are using some form of IM (Patton, 2003).

SMS, a service for sending short text messages to mobile phones, is an asynchronous mode of communication. SMS is highly valued because it provides the opportunity of delaying the reception and the answering to a more appropriate time. Consequently, there is a very low threshold for sending such a message, such as merely trying out whether recipients take notice of the message, answer it, or even “escalate” the relationship by calling back orally. The second advantage of SMS is its privacy in contrast to oral calls: it is relatively certain that the SMS will be received by the individual to whom it is sent, without anybody else taking notice. The need for extreme shortness (typically limited to 160 characters) makes it legitimate to use conventionalized forms of writing. And even shy people (or people from cultures which prohibit very subjective expression) feel free to communicate because they do not have to expose themselves in a highly personalized way (Thurlow and Brown, 2002).

Recent developments in mobile communication services imply that the mobile phone is becoming an increasingly important communication and information distribution medium. A study by Barwise and Strong (2002) reports an overall

penetration of mobile phone at almost 70% in the UK in August 2001 and East Asia area is believed to be as high as 70-80% (Thurlow and Brown, 2002). In some user segments, such as the ages 18 to 24, there is a penetration rate of almost 80%. Voice is reported as the key application of mobile phones, but SMS sent from mobile phones is increasing very fast. In Barwise and Strong's study, the use of SMS services is very high among the youngest users, about 93% of mobile users aged 18 to 24. Interestingly, SMS is used more on a daily basis than voice among users below 25 years (Nysveen and Pedersen, 2002).

Among the three electronic messaging media, email, IM, and SMS—while they appear to differ—there are several important characteristics in common. Each requires written communication by typing. Writing the message requires more physical effort and a longer time than speaking. Each message is presented in text only and what can be expressed is constrained by the lean written system, which in this case is alphabetic. More than that, all of them lack the full range of paralinguistic cues, providing no verbal or social clues because communicators are not visually or auditorially present. The feeling of contact or social presence via each of them is lessened and communication is likely to be described as less friendly, impersonal, and task-oriented (Rogers, 1986). However, all such types of communication disregard distance as a barrier since written communication is possible even with those physically separated in time and space.

Not only as a technology for communication but also as a text-based format like IM and online chat, the study of SMS is easily brought within the general category of CMC (Thurlow and Brown, 2002). University students are using email, IM and SMS,

in conjunction with face-to-face and telephone interaction, to communicate and coordinate their actions both for learning and for social activities (Segerstad and Ljungstrand, 2002). However, few studies have examined IM and SMS in depth, though email has been an important topic in business research for more than a decade. Little is known about how students perceive these messaging media, compared with traditional media. Which medium is most preferred for accomplishing specific communication tasks in students' learning?

To answer this significant question, medium-task fit framework that describes some basic insight into why individuals choose a particular medium for a particular task is provided in next section.

Medium-Task Fit Perspective---Media Richness Theory

Media richness theory proposes that task performance will be improved when task needs are matched to a medium's ability to convey information (Daft and Lengel, 1986b). Media richness is defined as a medium's material capability to convey certain types of information (Daft and Lengel, 1986a). Communication media can be arrayed along a continuum of media "richness" based on each medium's capacity for immediate feedback, multiple cues, language variety, and the personal focus of sources (Daft and Lengel, 1984). Building upon Daft and Lengel's (1986b) media richness criteria, face-to-face interaction is perceived to be the richest medium since it supports the highest level of interactive activities by providing continuous feedback during the interaction, various social cues and body language, and enables unpredictable and spontaneous remarks. Compared to face-to-face interaction,

telephone (verbal) communication is considered less rich since communicators are not physically present, and the visual mode is missing. However, telephone communication is still ranked quite high in terms of media richness since it provides synchronous communication and audio cues. Empirical studies show that telephone calls often function as a full substitute for face-to-face meetings (Licoppe and Heurtin, 2002). The telephone enlarges the social networks of individuals by adding communication that otherwise would not occur (Geser, 2004). The telephone also facilitates contacts during times when individuals do not feel disposed to present themselves visually. One more reason for the relatively rich ranking of the telephone is that voice contacts have capacity to articulate personal emotions through verbal cues (Geser, 2004).

Since the work of Daft and Lengel (1986b), email has been added to the set of available communication media as a new medium and numerous studies have been conducted to examine the role of email in organizational communication practice. In terms of media richness, email was ranked lower than the telephone since it permits the transmission of fewer types of visual and non-verbal cues, and no quick feedback can be guaranteed. IM, as a semi-synchronous interaction medium, can be perceived higher than email in media richness. Since participants have to be online for communication, the time delay in IM is much less compared to email, and in this respect comes closer to spoken communication. However, it is physically more of an effort and more time consuming to write than to speak. Thus, IM is less interactive than face-to-face and telephone, while better than email. Due to the length limit, SMS

is unable to provide as much information as email, and thus is perceived as less rich than email.

Daft and Lengel (1986b) categorized communication tasks based on uncertainty and equivocality. Task uncertainty is caused by a lack of sufficient information and can be overcome by acquiring additional information. Task equivocality is caused by ambiguity, the existence of multiple and conflicting interpretations about an organizational situation (Daft and Macintosh, 1981; Weick, 1979). When managers are confronted with equivocal cues, they must discuss the issues among themselves and gradually arrive at a common interpretation and frame of reference. A major difference between uncertainty and equivocality is in the information processing response of managers. Uncertainty leads to the acquisition of data. Equivocality leads to the exchange of subjective views among managers to define the problem and resolve disagreements (Daft, Lengel and Trevino, 1987). Daft et al. (1987) propose that equivocality is the barrier confronting communication media. The organizational response to equivocality is to create a solution rather than to find a solution in external data. The management group defines what events mean and enacts a solution. Thus, differences in task environments represent a variety of information processing requirements that may be satisfied by different communication media. In short, media richness theory proposes that (a) media differ in richness; (b) tasks differ in information processing requirements; and (c) performance improves when managers use richer media for equivocal tasks and leaner media for unequivocal tasks (Daft and Lengel, 1986b; Daft et al., 1987). Efficient communication takes place when the match is perfect: the medium has neither more nor less communication capability than

the task required. Much research supports the general orderings of media on these dimensions, though there is considerable variation in support for the specific medium-task fit relationship. The theory is considered a rational process of finding the appropriate medium for the communication task.

This study is motivated to re-examine this theory in a wide media range. The interaction of media richness and task equivocality of communication task influences media preference. This simplified model is not intended to represent the full range of factors influencing media choice, such as both rational and social factors. Specific hypotheses are generated from this model.

H1. Media will be ranked on the basis of richness in the decreasing order of face-to-face, telephone, IM, email, and SMS.

H2. Respondents will select richer media for more equivocal tasks and leaner media for less equivocal tasks.

Culture and Medium-Task Fit Perspective

National culture is a fundamental force that forms, controls, and reinforces attitudes and behaviors on a continuous basis throughout the life of the individual, regardless of shifting organizational or group affiliations. The most popular cultural theory that has been commonly adopted in the field of information systems is Hofstede's model of culture (Tan, Wei, Watson and Walczuch, 1998b). Hofstede defines that culture is "the collective programming of the mind which distinguishes the members of one group or category of people from another" (1980, p.25). Among cultural dimensions identified by Hofstede, the individualism-collectivism, a basic

distinction among cultures (Singelis and Brown, 1995), is the one dimension that reflects the fundamental contrast in cultural orientations between Western and Eastern groups (Ho, 1979). It is the dimension on which Australia and China are maximally differentiated in Hofstede's empirical study of fifty countries. Because Hofstede's model has been the most widely validated by theoretical and empirical evidence (Tan et al, 1998b), and because individualism-collectivism dimension has been used extensively in communication for developing hypotheses concerning the relationships between culture and communication behavior (e.g. Gudykunst et al., 1996; Guo, 2002; Rice, D'Ambra and More, 1998; Singelis and Brown, 1995), this study uses this dimension as the underpinning cultural theory to explain people's media choice differences.

According to Hofstede (1980), the individualism-collectivism dimension is a conglomeration of values concerning the relation of an individual to his or her collectivity in society. Individualism stands for a preference for a loosely-knit social framework in society wherein individuals are supposed to take care of themselves and their immediate families only. Cultures characterized by high individualism promote individual identify. They value pleasure, achievement, competition, and autonomy; they are more likely to follow personal desires (Wheeler, Reis and Bond, 1989). Australia is a typical individualistic culture (Hofstede 1980). Its opposite, collectivism, represents a preference for a tightly-knit social framework in which individuals can expect their relatives, clan, or other in-group to look after them in exchange for unquestioning loyalty (Erez and Earley, 1993). People from a collectivistic culture value security, obedience, and harmony within the team and

maintain relatively tight-knit or cohesive groups. They are more group oriented and promote group identity. “Face” is an important psychological construct that is closely tied to “honor”, “shame”, and “obligation” (Erez and Earley, 1993). Chinese culture is typically high collectivistic.

The need to preserve group harmony in a collectivistic society can be seen in the communication style. People in a collectivistic society favor high-context (HC) communication style (Gudykunst et al., 1996; Singelis and Brown, 1995), while low-context (LC) communication style is predominant in an individualistic society (Singelis and Brown, 1995). Hall (1976) has demonstrated that high-context communication style perceives the external environment, the situation and non-verbal behavior to be highly significant for the creation and interpretation of communication, whereas low-context communication style believes that these factors are less important.

Australian respondents, characterized with individualistic values and low-context communication orientation, can be said to prefer an explicit communication style, be more rational than emotional, and be less reliant on social cues in ambiguous situations. They favor precision, directness, and certainty in conversations (Gudykunst et al., 1996). They perceive explicit, direct, and clear communication styles, such as email and paper documents, as the most effective (Kim and Wilson, 1994). They see email as an opportunity to share opinions frankly (Tan, Wei, Watson, Clapper and McKean, 1998a) and seek technology as a means for self-betterment (Umanath and Campbell, 1994). In contrast, Chinese respondents, characterized by high collectivism and high-context communication style, promote an implicit and ambiguous

communication style, more emotional than rational, and relying on more social cues in ambiguous situations. Chinese people are expected to prefer direct channels, such as face-to-face or telephone for access to information, over written documents. The emphasis on oral communication in Chinese culture could be due to the importance of the external communication context in this culture. They might prefer synchronous media more, such as face-to-face, because of their greater emphasis on traditional use of time, and the increased value they place on accessing and evaluating the contexts underlying communication (Rice et al., 1998). They may try to avoid conflict through increased vagueness, rather than by increased explicit communication (Rice et al., 1998). They may see mediated media as a threat to group harmony because mediated media allow loyalty and obligation to be challenged (Tan et al., 1998a). The emphasis on implicit and ambiguous communication style implies that people from collectivistic cultures possibly interpret situations as being more equivocal (Rice et al., 1998).

Research has shown that an industrialized country like Japan, with access to the latest information technologies, still relies more on face-to-face or telephone communication than the written method, such as email (Straub, 1994). In Limaye and Victor's study (as cited in Steinwachs, 1999), they suggest that the determining factor is not the degree of industrialization, but whether a country falls into low-context or high-context cultures. They further suggest that in high-context cultures like that of Japan a larger portion of the message is left unspecified and accessed through the context, non-verbal cues, and between-the-lines interpretation of what is actually said or written. In contrast, attributed to their low-context communication style which was

best suited to the lack of feedback, American people found it much easier to convey their opinions and felt more able to explain themselves via asynchronous communications tools than did Asian participants (Massey, Montoya-Weiss, Hung and Ramesh, 2001).

The above discussion indicates that the individualism-collectivism dimension of the culture may have impact on media perception and preference: the individualistic cultures characterized by low-context communication style are argued to rely on the use of words to convey meaning. Unambiguity and specificity are characteristics of low context communication in which messages are spelled out clearly. On the other hand, in a collectivistic culture where high-context communication style is predominant, people do not rely on language alone for communication. Tone of voice, timing, facial expressions, and behaving in ways considered acceptable in the society are major means of expression (Anderson and Hiltz, 2001).

Across five media discussed here, face-to-face and telephone are ranked higher, email and SMS are ranked lower in richness, while IM is in the middle of the ranking. Thus, the direct cultural impact on media perception, task equivocality and preference may be found between Chinese and Australian respondents for richer and lean media, while no difference is expected between these two cultural groups in IM perceptions and preferences. Culture may also moderate the relation among media richness, task equivocality, and preference. Accordingly,

H3. Chinese respondents will perceive face-to-face and telephone to be higher, email and SMS to be lower in richness than those of Australian counterparts, and

there will be no difference between Chinese and Australian respondents in terms of IM richness.

H4: Chinese respondents will perceive communication task to be more equivocal than those of Australian counterparts.

H5: Chinese respondents will choose face-to-face and telephone more frequently, email and SMS less frequently for communication than those of Australian respondents for equivocal situations. And there is no difference between Chinese and Australian respondents in IM preference.

H6. The association between media richness and media preference will be higher for Chinese respondents.

H7. The association between task equivocality and media preference will be higher for Chinese respondents.

Research Method

Samples and Data Collection

Data for this study were collected through a survey both in China and Australia. The participants were 52 undergraduate students in a large university in China and 50 undergraduate students from a large university in Australia. The average age of the Chinese subjects participating in the study was 19 years and 60% were male. All Chinese participants have Chinese ethnic background. The average age of the Australian subjects participating in the study was 20 years and 74% were male. All Australian participants have Australian ethnic background.

All materials were translated into Chinese, and then translated back to ensure that the Chinese version of the questionnaire represented the intent and spirit of original documents and were not merely a literal translation. All participants completed the questionnaire in their native language. The questionnaire was completed in classrooms and required approximately 20 minutes to complete.

According to Adler (1984) and Sekaran (1983), cross-cultural study should only be done with “matched samples”, in which the samples are similar in all respects except culture. Otherwise, the observed cultural differences in the research model may be due to sampling differences rather than cultural differences. Thus, apart from obtaining samples from similar background, such as large universities, similar study majors and similar university experience, the groups from each country were also compared on a number of variables, including age, gender, and media experience, which have the potential to influence the results. When samples are not matched in non-cultural variables, these “non-matched”, “non-cultural” variables should be under control in comparison hypotheses testing if they are also correlated with dependent variables. The Australian sample had significantly more experience of using all three messaging media, compared with their Chinese counterparts. However, only years of using email was found to be correlated with email preference ($\gamma = .40, p < .001$). Thus, years of using email was considered as a control in subsequent comparison tests.

Measures

The independent variable was cultural individualism-collectivism dimension. The dependent variables were perceived media richness, media preferences, and perceived communication task equivocality.

The independent variable of cultural individualism-collectivism dimension was measured at the individual level using a 9-item scale derived from Earley's (1993) work. Examples of items include "People like to work in a work group rather than by themselves," "In society, people are born into extended families or clans who protect them in shared necessity for loyalty," "I should accept the work group's decision even when personally I have a different opinion," and "Problem solving by work groups gives better results than problem solving by individuals." The response format was a 7-point scale with anchors ranging from 1=strongly disagree to 7=strongly agree, where high scores indicated individualistic beliefs. Three items were eliminated to achieve satisfactory reliability of .79 (Cronbach's alpha).

Perceived media richness was measured with a 4-item scale developed by D'Ambra and Rice (1994) across five available media: face-to-face communication, the telephone, email, IM and SMS. An example item is: "if communicators are unclear about something or do not understand it, the medium (such as face-to-face communication, the telephone, etc.) allows them to ask questions and obtain answers as they arise". This item investigates the way the medium facilitates feedback. Three other items have a similar structure to tap the other characteristics of the medium. The respondents were asked to indicate the extent to which they agreed or disagreed with

the items on a 7-point scale ranging from 1=strongly disagree to 7= strongly agree, where higher values indicated greater media richness. The reliabilities of these scales also were generally satisfactory (.65, .72, .73, .77, and .79 for face-to-face, telephone, email, IM and SMS respectively).

Media preference was measured by asking the respondents to specify their ranking of preferred media for each of eight communication activities. These communication activities were originally developed by D'Ambra (1995) to capture daily organizational communication activities and have been used in previous media use and cross-cultural media studies (e.g., Guo, 2002; Rice et al., 1998). All communication activities were rephrased to fit the university context. These communication activities showed high loadings on a single-situation dimension (varying in equivocality). Table 2 below provides descriptions for each activity. Media preference was measured by directly asking the respondents to specify their preference rankings for each of the communication activities when they collaborated with their group. For each communication activity, for each medium, these rankings were scaled as 1=chosen 5th, 2=chosen 4th, 3=chosen 3rd, 4=chosen 2nd, and 5=chosen 1st.

Each communication task's equivocality was measured by using Goodhue's (1995) three-item scale. The items included "This activity is not well defined," "This is a non-routine activity," and "This is an activity I have never dealt with before." The respondents were asked to assess each activity's equivocality on a 7-point scale ranging from 1=strongly disagree to 7=strongly agree, where the higher values indicated more equivocality of the communication activity. The Cronbach alpha

reliability for the three-item equivocality mean scale was generally satisfactory, ranging from .52 to .71 across activities.

Results

The manipulation on national culture was checked using items measuring individualism-collectivism dimension. Chinese students were much lower on the index of individualism than Australian students. A t-test analysis confirmed the significance of this difference ($t(100)=12.14$, $p<0.001$). Therefore, the planned comparison could be made.

The dependent variables of interest in this paper include perceived media richness, media preference and perceived task equivocality. Table 1&2 below summarize the descriptive statistics for the dependent variables. Table 3, 4 & 5 show the results of the statistical analyses.

(Table 1 & 2 insert here)

Testing Media Richness Theory

The first aim of this study is to re-examine media richness theory in a wide media range, in particular, to see whether IM and SMS fit into media richness theory. Hypothesis one was generated to rank media richness across five available media. A one-way ANOVA followed by post hoc significance tests was used to rank media richness. Five media was found to be significantly different from each other ($F(4,505)=121.89$, $p<.001$). As found in prior studies, face-to-face was rated as having the highest media richness, followed by telephone, IM, email, and SMS. Thus, hypothesis one was supported.

According to media richness theory, people will choose media based on a matching process, matching their choice of medium to the requirements of the communication situation. Table 2 shows media preference rankings for each of 8 communication tasks. In general, as equivocality of task decreased, face-to-face and telephone ranking generally decreased, email ranking increased, IM ranking did not change much, and SMS ranking slightly increased. Similarly, Figure 1 shows that there appears to be a moderate positive correlation between face-to-face preference and task equivocality, and a weak positive correlation between telephone preference and task equivocality. The figure also indicates email and SMS are negatively correlated with task equivocality even though the strength was not very strong for SMS. Furthermore, Table 3 lists correlations between mean medium preference and mean task equivocality, for each medium, for each task, across two cultures. Significant correlations were found for face-to-face ($r = .85, p < .01$), telephone ($r = .71, p < .05$), email ($r = -.78, p < .05$) and SMS ($r = -.77, p < .05$). As situations were more equivocal, people preferred to use face-to-face and telephone more and preferred to use email less, as expected by media richness theory. Correlations between average medium richness with average preference ranking aggregated over 8 communication tasks of that medium were weak, across two cultures. SMS ($r = .34, p < .01$) and IM ($r = .24, p < .05$) were two stronger correlates (see Table 3).

(Figure 1 inserts here)

(Table 3 insert here)

Cross-Cultural Comparisons

Hypotheses 3, 4 and 5 were developed to examine direct cultural level differences in terms of media richness ranking, task equivocality ranking and media preferences. It was argued that the collectivistic and high-context nature of Chinese culture determines that Chinese people would perceive face-to-face and telephone richer, email and SMS less rich and would prefer more use of richer media and less use of lean media in equivocal situation. IM was predicted to be in the middle point of media richness ranking and would expect no much difference between these two cultural groups in terms of richness ranking and preference. These hypotheses were examined with t-tests and Table 4&5 show the results.

(Table 4& 5 insert here)

T-values shown at the first part of Table 4 indicated the significant cultural level differences in IM and SMS richness. Although the ranking of media richness was in the same decreasing order of face-to-face, telephone, IM, email, and SMS for each cultural group, Chinese respondents rated IM and SMS as significantly more rich, compared to their Australian counterparts ($t=-2.11$, $p<.05$; $t=-5.05$, $p<.01$ respectively), while there were no significant differences between these two cultures in terms of face-to-face, telephone and email richness. Thus, hypothesis 3 was rejected.

Table 5 shows that Chinese respondents perceived the tasks as more equivocal, compared to their Australian counterparts (t-values in Column 3), which is consistent with high-context nature of Chinese culture. Thus, hypothesis 4 was supported. These

results support Rice et al's (1998) prediction that individuals from individualistic culture will rate situations as less equivocal than members of collectivistic cultures, although it was not supported in that study.

T-values shown at the second part of Table 4 indicate the significant cultural level differences in three messaging media mean preference. Australian respondents had significantly higher preference for email, compared to Chinese respondents. In contrast, Chinese respondents had significantly higher preferences for IM and SMS, compared to Australian respondents. No significant differences between these two cultural groups were found in face-to-face and telephone preferences.

The individual-level comparisons by situations shown in Table 5 indicate that among eight communication tasks, there were almost no significant differences in face-to-face and telephone preference between these two cultural groups (one exception for face-to-face, and one exception for telephone). There was also no cultural level difference in IM preference across seven communication tasks, except the task two in which Chinese respondents had higher preference than those of Australian respondents. The cross-cultural media preference differences were found in email and SMS between two cultures. In particular, Australian respondents preferred email more than their Chinese counterparts, while the Chinese respondents preferred SMS more than their Australian counterparts. So, email and SMS seemed to provide the clearest distinction between students in these two different cultural contexts, leading to the partial support of hypothesis 5.

Hypotheses 6 and 7 were developed to examine the moderating role of culture on media richness theory. It can be done by examining the correlations (a) between the equivocality of 8 situations and preference for specific media for each of these situations, and (b) between the richness of each medium and that medium's mean preference ranking (averaged over all situations), and (c) for each culture (Rice et al 1998). Table 3 shows the correlation results.

Although the individual-level correlations between task equivocality and media preference ranking were strong for face-to-face interaction ($\gamma=.84$, $p<.01$, $\gamma=.76$, $p<.05$) and SMS interaction ($\gamma=-.72$, $p<.05$; $\gamma=-.75$, $p<.05$) for Australian and Chinese cultural group, there were no statistically significant differences in the strength of the correlation between task equivocality and media preference for these two cultural groups (Pallant, 2001,p.126). Thus, consistent with previous study (Rice et al. 1998), the moderating role of culture on media preference was not found in this study. Furthermore, only correlation between Chinese respondents' email richness and email mean preference was significant. This implies no moderating influence of cultural context on the media richness and media preference relationship. The only exception was a moderate negative correlation between email richness and email preference by Chinese respondents, compared to a positive correlation for Australian respondents.

Figure 2-6 below indicate the relationships and strength between task equivocality and medium preference across two cultures, for each of five media. It graphically supported the statistical analysis discussed above.

(Figure 2-6 insert here)

Discussion

This major purpose of this study was to re-examine media richness theory in the newer media environment. Results from this study support some aspect of media richness theory and challenge others. This study also provides some insight into cultural impact on media perception and preference. These results, based on the statistical analysis, are discussed below.

Media Richness Theory in Newer Media Environment

The overall media richness rankings support prior measures and assertions. Face-to-face was rated highest, followed in the decreasing order of telephone, IM, email, and SMS. As a newer medium, IM was considered to be richer than email due to its semi-synchronous nature of interactions. Another new messaging medium, SMS, was perceived to be less rich than email due to its nature of length limit of the messages.

The results of this study also indicate some supports to media richness theory. The significantly strong and positive correlations between task equivocality and media preference for face-to-face and telephone indicate that richer media tend to be preferred more as the equivocality of task increased. The significantly strong and negative correlations between task equivocality and media preference for email and SMS indicate that lean media tend to be preferred more as the equivocality of task decreased. The medium preference for IM was in the direction as expected, even though it was not significant.

Although the preference for IM and SMS increased as the equivocality of task decreased, both of them were chosen as the least preferred media in all situations. Compared to them, email, a medium being used widely over last decade, was chosen first when the task became less equivocal. The possible reason for this result is that, comparing with email, IM and SMS are still new to the public. Despite their increasing utility in workplace and personal life, the diffusion and adoption of them are still in their early stage, compared to email diffusion and adoption. Thus, the low ratings for their preference may reflect unfamiliarity and low use of them for communication. This result echoes what happened to email at the time it was introduced (Rice, 1993), when Rice noted that “stable and higher assessments of email might await greater diffusion and familiarity” (p.479). This was also illustrated in Carlson and Zmud’s (1999) channel expansion theory which states that certain experiences contribute to the way that individuals develop perceptions of the richness of a communication medium.

Cultural Influence on Media Choice Theory

The first finding of this cross-cultural comparison study was that the overall media richness rankings are the same across cultures and support prior measures and assertions. In other words, people from different cultures all perceive face-to-face and telephone are richer, IM is less rich than them, and email and SMS are leaner than IM. However, this study identified a cultural-level difference in media richness perceptions in two different ways. Firstly, Chinese students, characterized by collectivistic values and high-context communication styles, perceived IM and SMS as higher in richness, compared to the individualistic Australian students. Secondly,

there were no differences between these two cultures in terms of face-to-face, telephone, and email richness.

This study found no significant cross-cultural differences in two traditional media preferences. The significant cross-cultural differences for three messaging media preferences were found in two different ways. Firstly, overall, Australian respondents had significantly greater preference for email than their Chinese counterparts, while the Chinese students had significantly greater preference for IM and SMS, compared to their Australian counterparts. Secondly, the individual level comparisons by situations found that Australian students prefer email more and SMS less than their Chinese counterparts.

Based on the review of cross-cultural literature in communication studies, Chinese respondents, characterized with collectivistic values and high-context communication styles, were predicted to perceive interactive communication media, such as face-to-face and telephone to be more effective and have a greater preference for them than their Australian counterparts who are more individualistic and use low-context communication. The possible reason for no differences of face-to-face preference found in this study may be that, as a traditional medium, face-to-face communication is a quite stable element in organizational infrastructure, and a cultural effect, if it ever existed, may have ceased to be meaningful over time (Rice et al., 1998; Straub, 1994). In the same fashion, the cultural influence on telephone use might also be diminished. Previous cross-cultural media choice studies demonstrate similar results between Western and Eastern cultural individuals (Guo, 2002; Rice et al., 1998; Straub, 1994).

The higher perception of and relatively greater preference for IM for Chinese respondents appear to be consistent with Chinese culture. The synchronous nature of IM provides opportunities for Chinese students to interact with each other and get feedback quickly. IM also makes it possible for Chinese people to be entailed in an encompassing social relationship, to fit in with the in-group, to act in an appropriate fashion, to promote the in-group's goals, to occupy one's proper place, to be indirect, and to read other people's minds (Markus and Kitayama, 1991). In contrast, Australian students are more independent and their behavior is organized and made meaningful primarily by reference to one's own internal repertoire of thoughts, feelings, and actions (Markus and Kitayama, 1991).

In terms of SMS perceptions and preference, no specific theories or previous studies have been found to explain the results obtained in this study. One of the possible reasons for Chinese students favoring SMS over Australians is the different degree of need for intimacy and social intercourse (Thurlow and Brown, 2002). The equipment used for SMS is small and mobile. It therefore affords users an unobtrusive and relatively inexpensive mode of communicating. Another advantage of SMS is that the asynchronicity of SMS allows users time for reflection before having to respond which in turn allows greater face-management (Ling and Yttri, 2002), an important concern for Chinese people. Thus, this technology is co-opted and exploited to serve the underlying imperatives of intimacy and intercourse. The more you want to keep in touch with your friends, the more you might use SMS. However, more research is needed to test this contention. Another possible reason is related to the characteristics of Chinese language. Since Chinese students sent their SMS in Chinese ideographs, a

limited string would be more information rich than the same length of alphabetic characters in English. Therefore, Chinese students may perceive SMS richer and have more preferences over their Australian counterparts. Affordability is probably another reason for Chinese students using SMS since, comparing with fixed line and mobile phone, SMS is much cheaper in China. However, there were no data collected in this study about this factor. Future research efforts need to consider this aspect of technology use. But, at least they indicated that media choice is determined by several factors, as demonstrated in a number of studies (Fulk and Boyd, 1991; Rice and Webster, 2002; Webster and Trevino, 1995).

Among three messaging media, email is the medium whose users have acquired extensive familiarity over the years. It has become more of a practical necessity than an object of fascination and fetish (Herring, 2004). Rogers (1986) found that characteristics of early adopters of a new technology may be vastly different from those found in the “take-off” stage or those considered as later adopters. Comparing to IM and SMS, email has become an “old” communication medium in most organizational communication behavior and personal life, especially in modern countries, such as Australia. In line with Carlson and Zmud’s channel expansion theory, it is not surprising that Australian respondents have higher preferences for email than their Chinese counterparts. To further investigate how the email differs from the other two messaging media in each cultural students’ learning activities, one-way MANOVAs were conducted with the five media as independent variables and the task equivocality of eight communication tasks as the dependent variables. These multivariate analyses were significant ($F=19.54, p<.001$; $F=13.07, p<.001$ respectively

for Australian and Chinese groups). Subsequently, one-way ANOVAs followed by post hoc significance tests were used to identify which media differ in fulfilling eight communication tasks. These univariate analyses are summarized in Table 4 and 5. Unlike past research (Rice, 1993) where email was separated from traditional media, Australian respondents perceived email to be equivalent with traditional telephone for fulfilling most of their communication requirements. This is consistent with recent research that found new communication technologies to be functionally equivalent with more traditional media (Flanagin, 2001). In contrast, this study found that Chinese respondents perceived the three messaging media to be similar in fulfilling certain communication activities. This is consistent with studies conducted a decade ago where all new media were clustered together with each other (Perse and Courtright, 1993; Rice, 1993).

Living in a developed country, Australian respondents have opportunities to adopt and use email easily and quickly than Chinese respondents. Australian respondents reported significantly more experience using email than their Chinese counterparts. However, the three messaging media are still relatively new to the Chinese, even though email arrived earlier than the other two media. Diffusion and adoption of these three messaging media in China are still in their early stages, compared with Australia, especially for email. This indicates that the use of new media evolves as users become more familiar with them. The adoption of technology may change over the diffusion process of a technology (Venkatesh and Morris, 2000). This also suggests that future research should consider whether the almost certain

increase in use of the technology for communication will influence the use of this medium (Leung, 2001; Williams and Rice, 1983).

Implications and Conclusions

This study represents the first step toward extending media choice theory (1) by including IM and SMS, and (2) by cross-culturally examining individuals' media perceptions and preferences within the context of university students. Thus, tradeoffs between internal validity and external validity were made and generalizability was limited so that internal validity would be enhanced.

Most people will point first to the small sample size of each cultural group of this study. Indeed, small sample size reduces the external validity of this study. A small sample size provides less statistical power. This study is also limited by considering only the cultural difference on the I/C dimension between Australia and China. However, apart from this cultural difference, these two countries have many differences in other aspects, such as political ideology, primary language, technology environment, and economic conditions. Although this study had measured and controlled some variables that have been identified to influence individuals' media perceptions and preferences, it is difficult and infeasible to obtain a setting that can control and match nations on all dimensions. China has become one of the most economically and politically important countries in the world. More and more Chinese students are studying overseas. Thus, although there is a distinct possibility that certain causal effects are unaccounted for, it was felt that the understanding of

how Chinese students perceive and use information technology in their university learning was important enough for the research to proceed.

The data for this research are cross-sectional rather than longitudinal. This study identified that, even for new technologies, new media may become folded in with more traditional media over time. Thus, a longitudinal research design collecting media perception and use data at different media diffusion process stages would further our knowledge toward understanding how uses of new technologies evolve as users become more familiar with them (see, for example, Rice, 1993). Nevertheless, this study has identified the importance of media familiarity and frequency of use.

One contribution of this study is to extend media richness theory by including two new messaging media, IM and SMS. This study demonstrates that the media richness ranking across traditional and new media is consistent with media richness theory. This study also provides empirical confirmation that individuals choose media in terms of a matching process of media characteristics and communication activity equivocality, as media richness theory predicts. Meanwhile, this study reveals that even new technology, such as email, shows a tendency to shift over time in terms of user's appropriateness or use ratings of them, supporting Rice's (1993) and Flanagin and Metzger's (2001) findings of new technologies. This would suggest that the time, familiarity and frequency of use of technology would have impact on individuals' perceptions of and preferences for media for communication (Herring, 2004). Although a perspective that focuses on media and task characteristics to explain individuals' media use remains important, this study also reaffirms previous cross-cultural media choice studies by identifying cultural influence on media perceptions

and preferences. Culture plays an important role in individuals' behavior in media use.

This paper also has pragmatic importance for managing multinational universities' and organizational information technology adoption, implementation, and diffusion. This paper shows that email, a new information technology medium, can be employed in much the same way as traditional media in fulfilling most communication requirements in Australia, where diffusion has progressed substantially, but not in China where email is still treated as a new medium, perceived differently from traditional media. This indicates that individuals' use of communication technologies may change over the various phases of adoption and different strategies should be employed to manage individuals' use at each stage of the diffusion process. The pace of information technology development is different across cultures. It is important to recognize such a difference and manage individuals' media use accordingly.

In addition, respondents' perceptions of new information technology media and their preferences about those new media reflect to some degree the culture to which they belong. IM and SMS are finally invading the business world (Patton, 2003). On this note, this paper indicates that not only multinational universities, but also multinational organizations, in implementing information technologies within their organizational contexts, should at least be aware of the cultural differences and prepare for the potential differences in responses of students and employees to these systems. Otherwise, it may be that the advantage of the technological innovation will

not offset the burdens of cultural change and lead to a difficult and prolonged adaptation (Straub, 1994).

This research effort is an initial step in documenting how new messaging media are being perceived and preferred, in conjunction with other traditional and new media in different cultural university contexts. In addition to the media characteristics determinism, the effect of social factors, culture, time, familiarity, frequency of using technology would need to be investigated in order to fully understand how new technologies are being adopted and used.

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Figure 1: Scatter plot for Media Preference and Task Equivocality Relationship Across Media

Figure 2: Scatter Plot for Face-to-Face Preference Across Cultures

Figure 3: Scatter Plot for Telephone Preference Across Cultures

Figure 4: Scatter Plot for Email Preference Across Cultures

Figure 5: Scatter Plot for IM Preference Across Cultures

Figure 6: Scatter Plot for SMS Preference Across Cultures

Sample Size	F-t-F	Tel	Email	IM	SMS
	Media Richness Mean (S.D.)				
102	6.31 (.64)	4.94 (1.04)	3.73 (1.23)	4.38 (1.2)	3.17 (1.3)

Table 1: Descriptive Statistics of Perceived Media Richness

Communication Task	Task Equivocality	Mean and S.D. of Media Preference by Task				
	Mean (S.D.)	F-t-F	Tel	Email	IM	SMS
Greater equivocality						
2. Discuss group problem with Lecturer in Charge (LIC)	4.50 (1.29)	4.72 (.64)	3.80 (.65)	2.86 (1.11)	2.25 (.93)	1.40 (.65)
4. Want clarification from LIC for a critical issue of your group project	4.25 (1.38)	4.53 (.94)	3.79 (.85)	3.03 (1.03)	2.24 (.93)	1.44 (.71)
1. Convince group members to support your ideas	4.15 (1.39)	4.93 (.29)	3.60 (.77)	2.34 (1.01)	2.71 (.86)	1.42 (.67)
5. Respond to an urgent request from a close friend about his/her time-sensitive project	4.12 (1.33)	3.70 (1.35)	4.23 (.93)	2.50 (1.23)	2.34 (1.08)	2.23 (1.20)
7. Clarify a procedural matter with your group member	3.92 (1.36)	4.13 (1.26)	3.56 (1.0)	3.14 (1.31)	2.49 (1.16)	1.69 (.9)
6. Organize a review with your group members for the project your group is undertaking	3.81 (1.28)	3.71 (1.54)	3.46 (1.06)	2.98 (1.33)	2.57 (1.2)	2.26 (1.4)
3. Advise your part of project to group members	3.54 (1.49)	3.60 (1.47)	3.07 (1.06)	3.73 (1.37)	2.71 (1.16)	1.92 (1.22)
8. Schedule a group meeting in two weeks time	3.40 (1.60)	2.56 (1.47)	3.39 (1.18)	3.90 (1.37)	2.51 (1.28)	2.78 (1.43)
Lower equivocality						

* Sample size is 102.

Table 2: Descriptive Statistics of Task Equivocality and Media Preference by Task

Medium	Correlations of Mean Medium Preference and Mean Task Equivocality			Correlations of Mean Medium Preference and Medium Richness		
	Aus	China	Overall	Aus	China	Overall
N	8	8	8	50	52	102
Face-to-face	.84**	.76*	.85**	.10	.06	.09
Telephone	.69	.56	.71*	.24	-.18	.02
Email	-.70	-.65	-.78*	.11	-.28*	-.19
IM	-.66	-.43	-.62	.18	.23	.24*
SMS	-.72*	-.75*	-.77*	.06	.23	.34**

*, p<.05; **, p<.01; ***, p<.001

Table 3: Correlations of Mean Medium Preference and Mean Task Equivocality, Mean Medium Preference and Medium Richness, for Each Culture and Overall

	Sample Size	F-t-F	Tel	Email	IM	SMS	F-value
Mean Media Richness							
Aus	50	6.4	4.86	3.55	4.13	2.59	135.10***
China	52	6.23	5.02 _a	3.91 _b	4.62 _a	3.74 _b	34.40***
t-value					-2.11*	-5.03***	
Mean Media Preference							
Aus	50	4.05	3.52 _a	3.50 _a	2.34	1.59	147.05***
China	52	3.92 _a	3.70 _a	2.64 _b	2.61 _b	2.18	82.34***
t-value				5.41***	-2.07*	-5.18***	

Note: the years of using email was controlled for email preference comparison across cultures; _{a,b} means with the same letter in the subscript within the same row are not significantly different from one another. * p<.05, ** p<.01, *** p<.001

Table 4: Cross-Cultural Comparison of Mean Media Richness and Preference

Task No.		T-E	Task-E Ranking	F-t-F	Tel	Email*	IM	SMS	F-value
Task 2	Aus	4.27	1	4.74	3.74	3.34	2.02	1.16	250.74***
	China	4.72	3	4.69	3.87	2.4 _a	2.55 _a	1.63	99.17***
	t-value	-1.75				3.83***	-2.49*	-4.00***	
Task 5	Aus	3.59	2	4.06 _a	4.22 _a	2.58 _b	2.2 _{bc}	1.94 _c	51.18***
	China	4.63	4	3.35	4.23	2.42 _a	2.48 _a	2.5 _a	21.50***
	t-value	-4.29***		2.78**				-2.42*	
Task 3	Aus	3.55	3	4.53	3.84	3.38	2.06	1.18	175.93***
	China	4.92	1	4.52	3.75	2.69 _a	2.4 _a	1.69	65.29***
	t-value	-5.73***				3.43***		-3.93***	
Task 1	Aus	3.46	4	4.94	3.48	2.78 _a	2.62 _a	1.18	183.67***
	China	4.81	2	4.92	3.71	1.92 _a	2.79	1.65 _a	165.66***
	t-value	-5.56***				2.95**		-3.86***	
Task 6	Aus	3.43	5	3.92 _a	3.32 _a	3.54 _a	2.48	1.74	27.50***
	China	4.17	6	3.5 _a	3.6 _a	2.44 _b	2.65 _b	2.77 _b	7.79***
	t-value	-3.08**				2.84**		-4.00***	
Task 7	Aus	3.31	6	4.04 _a	3.48 _a	3.6 _a	2.34	1.55	45.07***
	China	4.5	5	4.21 _a	3.63 _a	2.69 _b	2.63 _b	1.83	33.95***
	t-value	-4.92***				2.70**			
Task 3	Aus	2.89	7	3.48 _a	2.98 _{ab}	4.28	2.54 _b	1.76	34.30***
	China	4.16	7	3.71 _a	3.15 _{ab}	3.19 _{ab}	2.87 _b	2.08	10.70***
	t-value	-4.75***				2.97**			
Task 8	Aus	2.55	8	2.68 _{ab}	3.12 _a	4.5	2.46 _b	2.24 _b	29.30***
	China	4.13	8	2.44 _c	3.65 _a	3.3 _a	2.56 _{bc}	3.31 _{ab}	7.30***
	t-value	-5.74*				-2.35*	4.67***	-4.06***	

Note: First row for each activity provides means from respondents from Australia. The second row provides means from respondents from China. The third row shows significance of t-test between two cultures in terms of communication task equivocality and each media preference. T-E: communication task equivocality. a,b,c,d means with the same letter in the subscript within the same row are not significantly different from one another.

* p<.05, ** p<.01, *** p<.001, *: the years of using email was controlled for this comparison.

Table 5: Mean and Difference Tests of Media Preference for 8 Communication Task with Variety Equivocality, by Culture

Relationships Between Task Equivocality and Media Preference

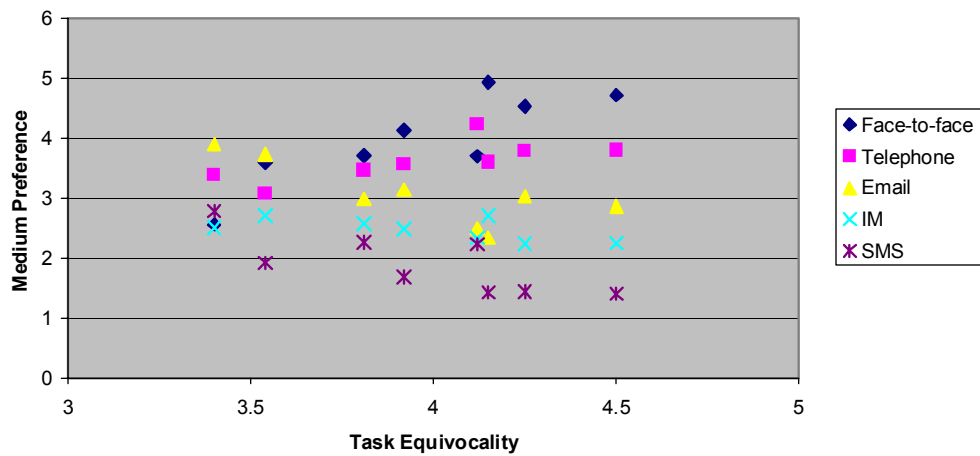


Figure 1: Scatter plot for Media Preference and Task Equivocality Relationship Across Media

Face-to-Face Preference Comparison

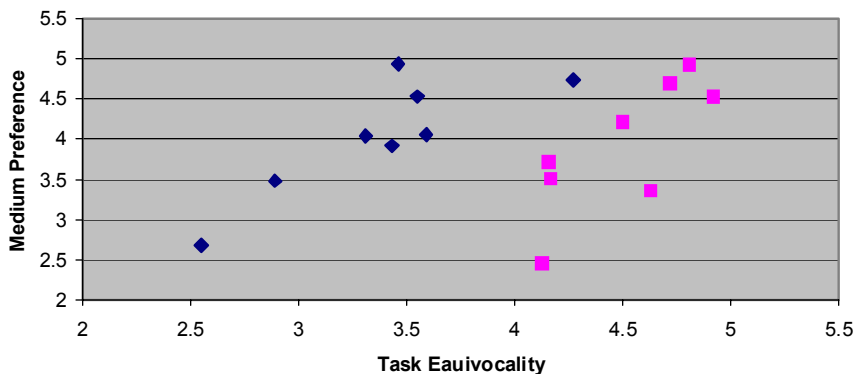


Figure 2: Scatter Plot for Face-to-Face Preference Across Cultures

Telephone Preference Comparison

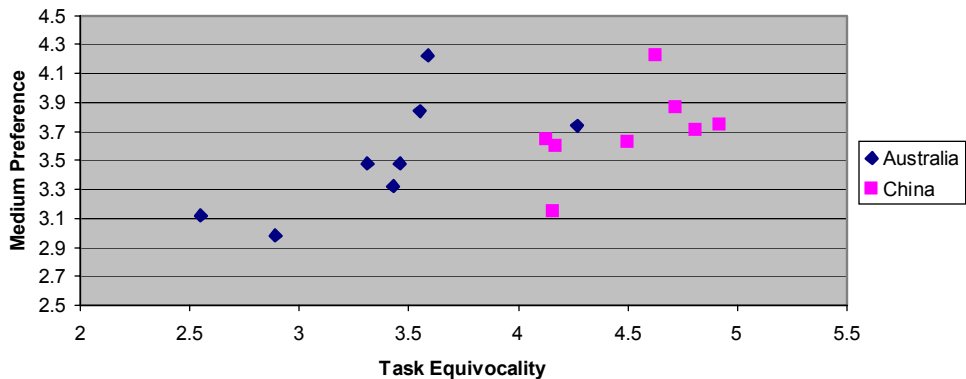


Figure 3: Scatter Plot for Telephone Preference Across Cultures

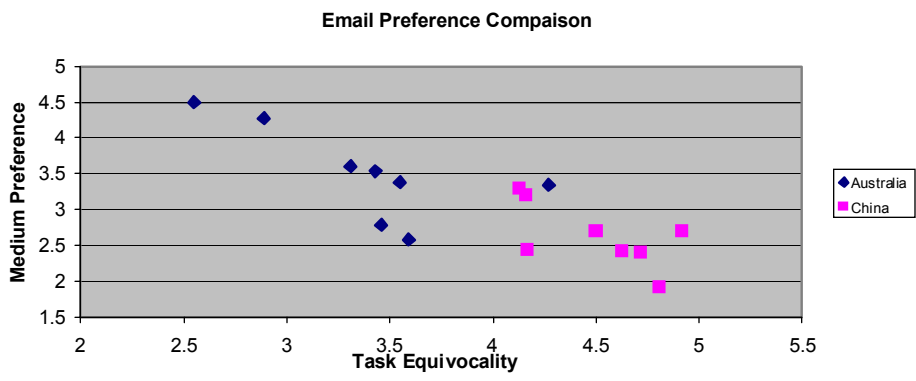


Figure 4: Scatter Plot for Email Preference Across Cultures

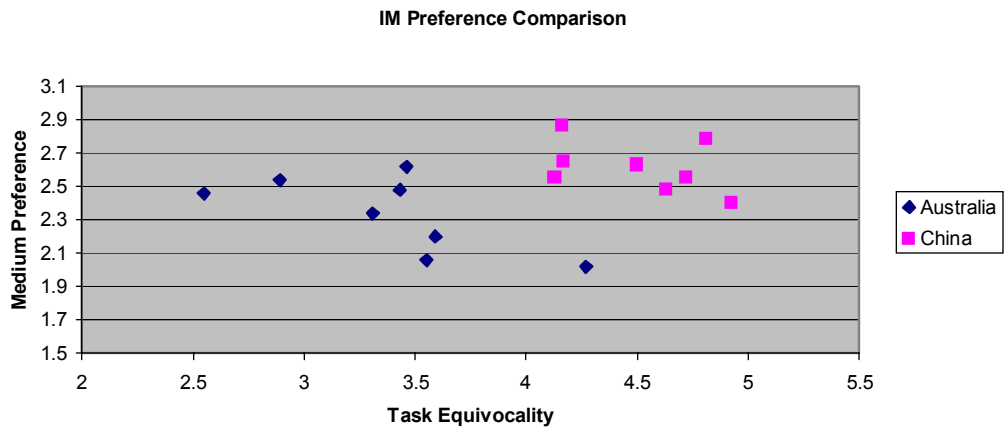


Figure 5: Scatter Plot for IM Preference Across Cultures

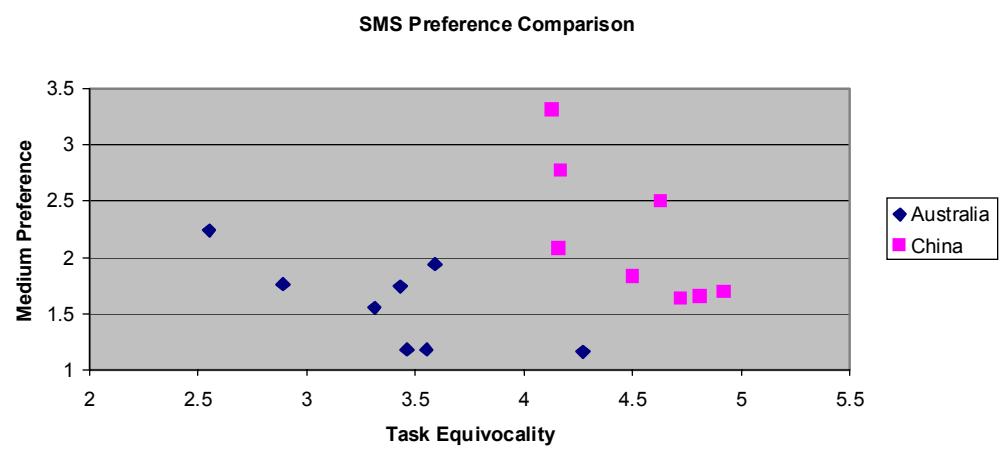


Figure 6: Scatter Plot for SMS Preference Across Cultures