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Cultural Differences in the Use of Instant Messaging Applications

Cross-Cultural Case Study of China and the Netherlands

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Abstract

Purpose: This study aimed to investigate mediation effects of features on different instant messaging apps, and to explore how cultural differences between Chinese and Dutch users influence the appropriation of instant messaging apps.

Method: Two studies were conducted. The first study was a content analysis of 24 instant messaging apps, focusing on the various features of these apps. An online survey focusing on users' appropriation of different features on instant messaging apps was conducted in the second study.

Results: The results of the first study show that features on instant messaging apps played different mediating roles on users' communication. The second study shows that there were significant differences in the appropriation of instant messaging apps between participants from different cultural background. A conceptual model was drawn to connect Hofstede's and Hall's cultural dimensions with the appropriation of instant messaging apps.

Conclusion: Results show that there are various features on instant messaging apps, which mediate users' communication in different ways. Some of them are important and should attract more attention from the app designers. The second study shows that culture dimensions do matter in the appropriation of instant messaging apps, which indicates that instant messaging apps could be designed with cultural consideration to be more applicable.

Key Words: cultural differences, instant messaging, mediation and appropriation

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1. Introduction

Instant messaging is a popular way of real-time electronic communication. It involves the use of instant messaging apps available on smartphones to engage in synchronous text-based conversations with individuals or groups. It has been found very useful in the circumstances when it is not easy to have face-to-face communication. Compared to other ways of interacting, such as email, phone calls, or traditional SMS, instant messaging seems to be more convenient, more spontaneous, and richer in context, which make it very attractive to users (Zhou, 2005). Tremendous growths in the use of instant messaging have been witnessed in the last few years. According to the latest report of the usage of instant messaging apps in 2015 by Lauren Foye, the monthly active users for WhatsApp, Facebook Messenger, QQ Mobile, WeChat, and Line are 800 million, 700 million, 603 million, 600 million, and 211 million, respectively. The report stated that younger users typically install multiple instant messaging applications on their phones.

Most instant messaging apps share the same basic features, such as sending messages and managing contact lists. At the same time, according to this report, the use of stickers, emoticons, images, and group chat all have significant added value to the increasing volumes of instant messaging traffic. Instant messaging apps may differ from each other in the specific features they have. Take WhatsApp and WeChat as examples. WhatsApp provides the last-seen time function to the users, enabling them to know the last time their contacts used the app. WhatsApp also allows users to find out if others have read their messages or not. WeChat, on the contrary, does not provide any of these functions.

With the existence of various features on instant messaging apps, it will be interesting to investigate differences in mediation on users. It is obvious that the maintenance of social relationships is the central function of instant messaging in general (Lewis & Fabos, 2005). However, in addition to fostering relationships online, the maintenance of offline social networks is also a function of instant messaging apps (Wellman, 2001). The intertwined relation between instant messaging apps and social networks is clear, but the socially mediated character of technology is less obvious. Instant messaging apps may shape and be shaped by social identities of its users (Lewis & Fabos, 2005).

Significant positive association between online communication and offline communication was found, suggesting that the use of instant messaging has significant effect on individual and relational level factors (Ramirez & Broneck, 2009). Research also showed that the use of instant messaging in the workplace has beneficial influence. A study (Isaacs, Walendowski, Whittaker, Schiano, & Kamm, 2002) showed that in the workplace, heavy instant messaging users use the apps to discuss a broad range of topics via many fast-paced interactions per day, while light users mainly use instant messaging apps for coordinating. Despite the fact that instant messaging allows us to communicate with anyone at anytime around the world, the negative impact of instant messaging is also recognized. Previous research (Fox, Rosen, & Crawford, 2009) found that the use of instant messaging apps might impede participants' efficiency in their studies or work. It may also cause negative feelings when users find themselves ignored by their online contacts or receive annoying messages from people they don't know.

As with the significant impact of instant messaging on people, the way people use the instant messaging apps has sparked the interests of some researchers. Thus, there are a growing number of studies into the factors that influence users' adoption of instant messaging apps (Nysveen, Pedersen & Thorbjørnsen, 2005; Wirth, Pape & Karonowski, 2008). Moreover, a new research paradigm has emerged, focusing on the concept of "appropriation". It addresses the ways in which people implement new communication technologies after having adopted them (Lievrouw & Livingstone, 2002; Katz & Aakhus, 2002;). According to Wirth et al. (2008), appropriation is an "active and creative process that ends in various usage and meaning patterns on both individual and social levels" (p. 598). It also depends on social conditions such as cultures and norms.

Cultural values and norms strongly influence effective communication and cooperation (Li, Rau, & Hohmann, 2011). Cultural scholars have identified several dimensions along which cultures vary that may impact the use of instant messaging. For example, Western cultures stress "individual initiative" and "independence", whereas Eastern cultures emphasize "group solidarity" and "collective identity" (Kayan, Fussell, & Setlock, 2006). The cultural dimensions of individualism versus collectivism (Hofstede & Hofstede, 2001) and high-context versus low-context (Hall,

1976) are believed to be most likely related to users' appropriation of the instant messaging apps.

1.1Research Questions

Given the fact of diverse features on instant messaging apps, and the lack of previous research into their influence on users, the first research question of this study is: how do different features mediate users' online communication? To answer this question, a content analysis of the features on 24 worldwide popular instant messaging apps was conducted, and the results were used to explore the mediated connections between instant messaging apps and users. With these mediated connections between instant messaging apps and users, as well as the cultural differences proven to be the major influence on people's behaviour (Hall, 1977; Hofstede, 1994; Hofstede & Hofstede, 2001), the second research question of this study is: how do Chinese and Dutch cultures influence people's appropriation of instant messaging apps? In order to answer the second research question, on online survey was conducted among three groups of participants: Chinese users living in China; Chinese users living in the Netherlands, and Dutch users. The online survey focused on users' use behaviours and attitudes toward the mediation and appropriation of different features on instant messaging apps.

1.2 Theoretical and Practical Relevance

Despite the well-developed literature and investigations regarding the effects of instant messaging apps on people's social relationship, and their impact on the efficiency of work or study, only few studies have examined the mediation roles of the features on instant messaging apps. To the best of our knowledge, the research presented in this study is the first to explore the mediation of features of 24 instant messaging apps on users. This study gives a comprehensive and overall summary of the features on instant messaging apps, and develops the mediated connections between users and instant messaging apps. What is more, in the past two decades, the studies on instant messaging have primarily focused on the Western world. It was only recently that a few studies came up to examine cultural issues comparing western cultures and other cultures. Those studies mainly focused on user behaviours between Asians and North Americans (Li et al., 2011). Although in general, Europeans and

North Americans are all called Western people, cultural differences still cannot be ignored. Take Americans and Germans for example: cultural differences exist in communication (Oetzel et al., 2001) and decision-making (Campbell, Graham, Jolibert, & Meissner, 1998). Considering the increasing globalization of markets and multinational collaboration, it is very useful to study differences between Asian and European people. This study is the first to investigate cultural differences regarding instant messaging apps between Chinese and Dutch users.

In addition to the theoretical relevance, this study may also be practically meaningful for the designers and developers of instant messaging apps. The results of this study will help them to understand the users of instant messaging apps better. For instance, if a designer is designing an instant messaging app targeting Chinese users, he or she may take the impact of Chinese cultural into consideration, and make the users feel more comfortable, which may facilitate the appropriation of the app.

2. Theoretical Framework

2.1 Studies on Instant Messaging Applications

There are a variety of studies about instant messaging apps. Some of the studies focused on examining the impact of the basic features of instant messaging apps (e.g., Green et al., 2005; Qian & Scott, 2007). With the development of the features, a few studies examined the advanced features such as audio and visual features. For example, researchers (Kim, Kim, Park, & Rice 2007) compared the use of instant messaging apps with other media. Chung and Nam (2007) explored predictors related to self-efficacy of the use of instant messaging apps.

Since instant messaging is an emerging technology, many studies were conducted by the developers of the instant messaging apps using colleagues in their own organizations (e.g., Issacs et al., 2002) or investigated teenagers and university students (e.g., Grinter & Palen, 2002). Additionally, a notable study built on communication media theories to demonstrate that instant messaging users exhibited the signs of "interaction" as well as the less anticipated signs of "outer action" when using the instant messaging apps (Nardi, Whittaker, & Bradner, 2000).

Studies were also conducted about the distraction caused by using instant messaging apps in the workplace (e.g., Bailey & Konstan, 2006; Cutrell, Czewinski,

& Horvitz, 2000). The use of instant messaging apps was linked to slower time to complete tasks and more errors in finishing the target activities.

In addition, some studies drew attention to the emergence of a "secondary orality" as a result of instant messaging apps. According to Ong (1979; 2013), the development of electronic media has brought people into time of secondary orality, which is re-emergence of an oral type of discourse within cultures. The secondary oral culture today has reached the highest level of development in computer network.

Cameron and Webster (2004) gave an overall summary of the empirical research on instant messaging apps. The existing studies and theories are useful in investigating the use of instant messaging apps at workplace, among teenagers, or the addiction to instant messaging apps. However, few studies into the mediation and appropriation of instant messaging apps exist. This study will pay more attention on the mediation and appropriation perspective on instant messaging and then connect it with cultural theories.

2.2 Mediation and Appropriation of Technology Use

Accoring to a study (Huysman, Steinfield, Jang, David, Poot, & Mulder, 2003), the appropriation of information technology by a group of people is commonly understood as a dynamic and evolving process, which has quite unpredictable outcomes. This is particularly true for communication technology that allows for various use purposes, such as instant messaging. Thus, the appropriation of communication should be explicitly moderated in a process termed technology-use mediation. Technology-use mediation was described as a "deliberate, on-going, and organizationally sanctioned" intervention (Orlikowski, Yates, Okamura, & Fujimoto, 1995).

What's more, previous studies emphasized the importance of openness for many use purposes and active roles of users in finding the most appropriate ways to use the different functionalities embodied in the technologies (Huysman et al., 2003; Williams, Stewart, & Slack, 2005). Study also focused on home technology, running a six-month study on families who had bought a new television (Petersen et al., 2002). In the study they highlighted the complexity of interplay between users' expectations triggered by technologies. The appropriation of technology has also been studied in interpersonal communication. Studies showed mediated features of visual images (Voida & Mynatt, 2005) and noticed the usefulness of animations for expressing emotions (Persson, 2003) on instant messaging apps. Scholars (Forlizzi & Battarbee, 2002) pointed out the interactional character of instant messaging: once receiving a message, users may interpret it from their own standpoints. It is also found that new technologies are in line with existing social practices, sometimes through uneasy adaptation (House et al., 2004), and early adopters' expectations of new technologies do not always match its usefulness in social settings (Oksman, 2005).

2.3 Culture and Instant Messaging Applications

The most widespread definition of culture was given by Dutch cultural anthropologist Geert Hofstede, who defined culture as "the collective programming of the mind that distinguishes the members of one category of people from those of another" (1991, p.5).

In the last decade, efforts have been made to examine the effects of cultural differences on the use of instant messaging apps. Researchers (Setlock, Fussel, & Neuwirth, 2004) compared three different cultural groups on the use of instant messaging communication among Americans, Chinese, and Chinese Americans. They found that differences in the use of instant messaging apps were reduced between different cultures, but still existed. Additionally, scholars (Kayan, Fussell, & Setlock, 2006) investigated cultural differences in the use of instant messaging between Asia and North America. Results showed that group chat and emoticons were much more popular in Asia than in North America. In another more recent study, Setlock and Fussel (2004) conducted interviews of Asians and North Americans and found that multi-media functions were more important for users in China, Korea, and India than for users from America.

2.4 Dimensions of Cultural Differences

Cultural differences may be characterized by cultural dimensions, which are aspects of cultures that can be measured relative to other cultures (Hall, De Jong, & Steehouder, 2004). There are two influential sets of cultural dimensions developed by Geert Hofstede (1994, 2001) and Edward T. Hall (1976). Hofstede did research on

cultural differences based on surveys and interviews with employees at IBM, originally from 53 countries, and later expanded to 74 countries. After the collection of data, Hofstede constructed widely used dimensions to describe cultures. According to Hofstede (2001), five dimensions can be distinguished: (1) masculinity versus femininity; (2) high versus low power distance; (3) strong versus weak uncertainty avoidance; (4) individualism versus collectivism; and (5) long-term orientation versus short-term orientation. Hall (1976) described the cultural dimension as high-context and low-context. The former represents the verbal messages that are mainly encoded linguistically, while the latter represents the messages that are encoded in the context.

Masculinity versus Femininity

This dimension describes the distribution of gender roles of masculinity and femininity, which differs depending on the countries (Hofstede & Hofstede, 2001). In high masculinity cultures, men are supposed to be confident, solid, and focus on material accomplishment; women are supposed to be more modest, softer, and concerned with the quality of life.

High Power Distance versus Low Power Distance

Power distance involves the extent to which the less powerful members of a society accept the inequality among individuals. People in societies with high power distance accept the hierarchical order without any further justification. In countries with low power distance, people try to balance the distribution of power and demand equal power. In general, they see other individuals more equally, and believe that authority and inequality should be minimized in the society (Hofstede, 2001).

Strong Uncertainty Avoidance versus Weak Uncertainty Avoidance

Uncertainty avoidance is defined as the extent to which the members of a culture feel threatened by uncertain or unknown situations (Hofstede, 2001). In societies with strong uncertainty avoidance, people try to minimize the unpredictability in their lives. They are seeking for more security in their lives. On the other hand, weak uncertainty avoidance societies maintain a more relaxed attitude towards unknown circumstances. Individuals in low uncertainty avoidance cultures need more adventures and are not afraid of risks.

Individualism versus Collectivism

Individualism refers to the societies in which ties between individuals are loose: individuals are expected to look after themselves and their immediate families. The opposite side of individualism is called collectivism. It is the extent to which individuals are integrated into groups (Hofstede, 2001). The individualism versus collectivism dimension indicates the cultural differences in acting as individuals versus acting as members of a group. Western countries are commonly considered as individualistic societies, stressing on independence, while Asian are collectivistic societies, giving priority to maintain the relationships of groups.

Long-Term Orientation versus Short-Term Orientation

The dimension between long-term orientation and short-term orientation indicates the extent to which a society has a future-oriented perspective rather than a current and short-term point of view (Hall, de Jong, and Steehouder, 2004). Individuals in long-term orientation cultures value things can bring future rewards (Hofstede, 2001). The opposite pole of it is the short-term orientation, which stands for the cultivating of virtue related to the past and present.

High-Context versus Low-Context

Hall's (1976) high-low context dimension of culture is also relevant to the way people communicate with each other. Context was defined as "the information that surrounds an event; it is inextricably bound up with the meaning of the event" (Hall, 1990, p. 6.). In high-context cultures, according to Hall, people are very similar concerning to experiences, information networks and so on. Therefore, in these societies, information is a part of the context or is internalized in the people; very little is made explicit as part of the messages (Hall et al., 2004). On the other hand, in low-context cultures, messages are very little embedded in the context or the people involved, they are expected to contain most of the information, and should be explicit and direct (Liu, 2003).

In this paper, the cultural differences between West European and Asian participants, specifically Dutch and Chinese, can be characterized by the combination of Hofstede's individualism versus collectivism dimension and Hall's distinction between low-context and high-context. According to the available cultural indexes, Dutch participants are expected to be on the individualism and low-context end, whereas Chinese participants are on the collectivism and high-context end.

It has to be emphasized that the dimensions reflect group differences, and should not be used to predict individual behaviours. It should also be realized that cultures are always different in more than one dimension at the same time. Thus, the classification of Chinese and Dutch participants is just a simplified reality, and will be used for further research hypotheses in this study.

2.5 Individualism versus Collectivism: Research Hypotheses

The individualism-collectivism dimension indicates cultural tendencies toward acting as individuals versus acting as group members (Hofstede, 1983). According to theorists (Kayan, Susan, & Leslie, 2006), people who are more inclined to be individual will stress individual initiative and independence more. On the other hand, people who are more inclined to be collectivistic emphasize group solidarity and collective identity more.

These differences might influence the appropriation on instant messaging apps. It can be assumed that people who are more individual will be less involved in the group chat comparing to people from collectivistic societies. For example, in collectivistic countries like China, people have a very close tie with their family and friends. Comparing to Chinese people, the tie between people and their family or friends is much looser in individualistic cultures like the Netherlands. Therefore, it can be assumed that Chinese are more willing to use the group chat on instant messaging apps in order to maintain their relationships with others. The first hypothesis can be made:

H1. Chinese instant messaging users have a more positive attitude toward group chat on instant messaging apps than Dutch instant messaging users.

What's more, people from individualism societies may find themselves more independently and freely to talk to strangers. It seems that Chinese are more reluctant to talk to people they don't know; whereas Dutch have a higher acceptance of talking to people they don't know. As Scholars (Gao & Ting-Toomey, 1998) argued, Chinese tend to become highly involved in communicating with people they know, but rarely talk to strangers. Therefore, it can be assumed that:

H2. Dutch instant messaging users have a more positive attitude towards talking to strangers on instant messaging apps than Chinese instant messaging users.

Research also suggested that people use instant messaging mainly to communicate with their offline friends (Boneva et al. 2006). In a study in the

Netherlands, 80% of young people use the online technology to maintain existing friendship networks (Valkenburg & Peter, 2007). It seems that the relations in the offline world can reflect the user behaviours of the online word. As in Chinese culture, individuals are closely linked to each other, and in Dutch culture, individuals are loosely lined to other individuals (Triandis, 1989), it may make sense that Chinese will use instant messaging apps more in their daily life to keep in contact with people from their offline lives. Hence, the following two hypotheses can be formulated:

H3. Chinese instant messaging users have a more positive attitude towards using instant messaging apps in daily life than Dutch instant messaging users.

H4. Chinese instant messaging users feel a stronger dependency on instant messaging apps than Dutch instant messaging users.

2.6 High-Context versus Low-Context: Research Hypotheses

According to Yang et al. (2011), the high-context versus low-context dimension is closely related to people's information processing and social patterns. As described by Hall (1976), high-context cultures employ verbally implicit communication and indirect expression. People from high-context cultures share situational and contextbased knowledge (Ting-Toomey 1988). In contrast, low-context cultures stress direct and explicit information. Their members share external and transferable knowledge. Most of the instant messaging apps provides features like video, audio chat, and emoticons when sending messages. This kind of messages contains more facial expressions (Veinott et al., 1999). Choi et al. (2005) found that people from highcontext cultures relied on visual elements of the text messages, while people from low-context cultures did not. It seems reasonable to imagine that people from highcontext cultures, like Chinese, might consider the ability of an instant messaging app to keep a fluid conversation important. It can also be assumed that if people are inclined to have a more fluid conversation on instant messaging apps, they may be less interested in keeping their chat history. Accordingly, the following two hypotheses can be made:

H5. Chinese instant messaging users have a more positive attitude towards fluidity on instant messaging apps than Dutch instant messaging users.

H6. Dutch instant messaging users have a more positive attitude towards record keeping on instant messaging apps than Chinese instant messaging users.

2.7 Culture and Face Theory: Research Hypotheses

Based on the combination of Hofstede's and Hall's cultural dimensions, Ting-Toomey (1998) believed that collectivistic/high-context cultures differ from individualistic/low-context cultures in many aspects, and came up with a theory, described people's desire to maintain their face. Hall et al. (2004) summarized theoretical propositions based on Ting-Toomey. The propositions are shown in Table 1.

Hall et al. (2004)		
Elements of "face"	Collectivistic/High-Context	Individualistic/Low-Context
Concern	Other-face concern	Self-face concern
Need	Positive face need	Negative face need
Mode	Indirect mode	Direct mode
Style	Obliging, avoiding, and	Controlling, confrontational, and
	affective-oriented style	solution-oriented style
Facework	Other-positive and other	Self-positive and self-negative
	negative	

Table 1: Collectivistic/High-Context versus Individualistic/Low-Context Facework, based on Hall et al. (2004)

According to Ting-Toomey (1998) and Hall et al. (2004), people from collectivistic and high-context cultures concern more about other-face, trying to maintain their other-positive facework and other-negative facework, which will protect other people's need for inclusion and appreciation as well as show respect for other people's need for freedom and space. It can be assumed that this kind of people may have more privacy concern when use instant messaging apps. For example, when a person deletes his/her friend from the contact list, he/she may want to protect his/her friend's face and don't want his/her friend to find out. In addition, when concerning about others' privacy issues, this kind of people may show more respect to others' privacy. Hence, we can make hypotheses from two sides of privacy:

H7. Chinese instant messaging users concern more about protecting privacy on instant messaging apps than Dutch instant messaging users.

Ting-Toomey (1998) also claimed that people from collectivistic/high-context cultures have a positive face need and want to be appreciated by others. Kitayama and Markus (2000) concluded that the roots of individualism and collectivism cultural gap could be found in fundamentally different perceptions of self. The differences in self-perception relate to how people learn about themselves and how important they consider self-consistency. It seems that Chinese people would rather maintain the online identity appreciated by others, no matter if it is consistent with their real identity or not. On the contrary, Dutch care more about their self-consistency between online world and offline world. As a consequence, Chinese users may be more reluctant to share their personal info in real life, such as their age, address, and location and so on with their online contacts. In addition, it might be harder for Chinese people to share their problems offline with others, because they want to save their face. Hence, they would find it is much easier to share their confidential problems online. According to these, it is reasonable to come up last tree hypotheses:

H8. Chinese instant messaging users believe more that their online personality is different with their true personality than Dutch instant messaging users.

H9. Dutch instant messaging users have a more positive attitude towards sharing personal info on instant messaging apps than Chinese instant messaging users.

H10. Chinese instant messaging users feel easier to share confidential information on instant messaging apps than Dutch instant messaging users.

2.8 Research Model

Based on the theoretical framework discussed above, this study established a research model, which suggests the effects of cultural dimensions on the use of instant messaging apps. The conceptual model is shown in Figure 1.



Figure1 Conceptual Model

3. Study 1: Features of Instant Messaging Applications

3.1 Method

3.1.1 Research Overview

The aim of Study 1 is to investigate the mediation roles different features play on users' online communication. First a content analysis of 24 popular instant messaging apps was conducted. After conducting the content analysis, the mediating functions of the results were studied. Study 1 would give an answer to the first research question of how do the features on instant messaging apps mediate users' online communication?

3.1.2 Coding Scheme

Most of instant messaging apps share the basic functions for communicating with online contacts. With instant messaging apps, people can also keep a list of contacts they interact with. According to Tyson and Cooper (2001), instant messaging apps mainly provide the following features:

- Instant messages: Second messages back and forth with contacts
- Video: Send and view videos, and chat face to face with contacts
- Images: Look at an image stored on your contact's device
- Files: Share files by sending them directly to your contacts
- Talk: Use the Internet to actually talk with friends
- Streaming content: Real-time stock quotes and news

Based on the above classifications, the basic features of instant messaging apps were summarized. Table 2 shows the features and specific examples under each feature.

Table 2 Basic features on instant messaging apps			
Features	Examples		
Instant messages	Text messages		
Video	Video calls		
Images	Share an image		
File management	Transfer files		
Talk	Audio calls		
Services	News		

Table 2 Basic features on instant messaging apps

They also mentioned that the capabilities of instant messaging apps have greatly expanded in recent years. For instance, some instant messaging apps will send notifications when selected contacts change their online status or send instant messages. With the increasing emergence number of the instant messaging apps, these described features in their article continue to be updated, and some new features were developed. Table 3 shows the results.

Table 3 Advanced features on instant messaging apps

Features	Examples
Group chat	Create a group chat
Strangers	Look around strangers
Message management	Withdraw a message
Record keeping	Search chat history
Contact management	Block a contact
Personal profile	Upload a personal photo

3.1.3 Corpus of Instant Messaging Applications

To collect features on instant messaging apps, this study selected 24 instant messaging apps. The first step was to select the instant messaging applications from thousands of apps. We first focused on the instant messaging apps, which are well used both for Chinese people and Dutch people, like Skype, Line, Gtalk and Viber. Then we were looking for the most popular and famous instant messaging apps in China, and we found WeChat, QQ Mobile, and EasyChat. The most widely used instant messaging apps among Dutch are WhatsApp and Facebook Messenger. To find the rest of apps, we used the key word "messaging", "IM", and "chat" to search in apple store. The rest of the instant messaging apps we found are: KakaoTalk, Tictoc, Kik, Telegram, IM+, VeeZ, TalkBox, iCall, AppMe, Snapchat, ICQ, Spotbros, MimeChat, Maaii, and Yahoo Livetext.

3.1.4 Procedure

After selecting and downloading all available instant messaging apps, the author of this study registered three accounts for each of these apps on two smartphones and one tablet. On every app, the author, pretending to be three different online contacts, sent text messages, emoticons, stickers, voice messages, and video messages; tried to make audio calls and video calls; created group chat and tried all of the functions of inviting contacts, deleting contacts, changing the setting for the group chat and so on. After carefully and thoroughly using the features on the instant messaging apps, the author made complete classifications for the features.

3.2 Results

The findings of the features are useful to investigate how they mediate users' online communication. It can be seen from the results, most of the instant messaging apps have group chat feature. As mentioned before, people may use group chat to maintain their offline relationships by creating a group and inviting their family, friends, or classmates/colleagues to different group chats. Each group chat may have a particular group name and represent a social circle of the users. With the advent of more and more serious privacy issues, instant messaging apps pay more attention on users' privacy concerns. Therefore, contact management and privacy management are

featured in most of the instant messaging apps. Users could hide their online status, or delete a friend from contact list without informing that friend. As for the personal info, most of the apps provide places where users could share their age, gender, or a clear photo of them. To allow users to keep their chat history with others, nearly half of the apps offer features like searching chat history by key words, or keeping the chat history on their computers.

Group chat

Most of instant messaging apps investigated in this study provide group chat function. In general, users can create any number of groups, and add other contacts to theirs groups. Users can invite their family members. friends. and classmates/colleagues to different groups. It may be a more helpful and easier way to maintain the relationships with the same group of people. By default, the creator is the administrator of the group. Group chat is visible to all members in the same group, and only to participants of that group. Group members can personalize the group chat by setting a group name, or uploading a group profile picture, and etc. However, there are many distinct features among different instant messaging apps. For examples, in a Korean instant messaging app called KakaoTalk, a user can set schedule for a certain event, and the rest of the group will see the event schedule and set a reminder for the event. What's more, the apps WeChat, KakaoTalk, and Tictoc allow members join an audio group chat together at the same time. Users can save a lot of time by talking instead of typing text to the group. These features of group chat may make users feel more convenient. In addition, there are some interesting features in group chat, take QQ Mobile, a widely used Chinese instant messaging apps, as an instance. In QQ Mobile, members can send anonymous messages to the group.

Strangers

Some of instant messaging apps investigated in this study tend to be used for supporting communications between strangers, or more accurately, people who do not know each other in real life, whereas other instant messaging apps offer less opportunities for users to talk to strangers. WeChat, QQ Mobile, and Easychat are three popular instant messaging apps in China. They all provide functions for users to talk to strangers, by looking around people nearby. If users find someone they are interested in, they can send greeting messages or send friend request to strangers. WeChat also has a feature of shaking. Users can shake their phones and be matched with strangers who shake phones at the same time. On the other hand, instant messaging apps, such as VeeZ, are very strict for talking to strangers. Only people who know your phone numbers or email address can send you friend requests.

Fluidity

To enhance the fluidity in a conversation, various interesting features may be contained in the instant messaging apps. However, the study shows that not many instant messaging apps stress on these features. Among the 24 instant messaging apps, only in WeChat users can withdraw their messages in 5 minutes. Snapchat is a popular instant messaging app among young people recently. On Snapchat, users can send a photo with text to their friends, and it will disappear in less than a minute. The only way for their friends to save the photo is to make a screenshot. With the reorganization of the growing importance of fluidity, it can be assumed that more and more instant messaging apps will provide fluidity functionalities.

Record keeping

Different with fluidity in instant messaging apps, record keeping allows users to save the chat history, search their chat history by key words, or transfer the chat history to computer or by email. Record may be very useful for some users when they want to find out what their contacts have said before, or something they cannot remember well. This kind of users may tend to use the instant messaging apps with different ways to deal with the chat history. On contrary, some users may feel very sensitive to the chat history, and do not want their words to be saved in their contacts' phones. Therefore, they will be more willingness to use instant messaging apps that do not save chat history for a long time.

Privacy

As mentioned in the introduction part, instant messaging apps differ in features concerning about privacy issues. For example, when users delete a friend from the contact list on some instant messaging apps, the friend will be informed by receiving a message. On other instant messaging apps, the friend will know nothing about being deleted, they just never get any response from the contact anymore. What's more, on WhatsApp, users can find out who read their messages and the exact time. It may cause some negative feelings for people who are waiting for the reply anxiously. While on WeChat, QQ Mobile and so on, it is impossible to find out whether your messages are read or not. Some people may be more straightforward and care less

about issues described above, whereas some people may be very sensitive and worried, leading to the different options for instant messaging apps.

Personal info

Most of instant messaging apps encourage users to set a personal profile, filling information like name, age, gender, address, and region. Users may also be encouraged to upload a personal photo. Additionally, some instant messaging apps allow users to share their real-time locations with their contacts. Users can have their own choices between providing true information or creating a fake identity. Except that on some instant messaging apps, the personal photo must be examined to be a real photo, otherwise the user cannot use the apps.

Sharing confidential info

Some sensitive and very private topics may be discussed via instant messaging apps. That is the reason why KakaoTalk, Telegram, Line, and IM+ have function of secret chat. This kind of chat is encrypted, which ensures that only the two participants of the chat can see the chat content. Some users may discuss their problems with their online contacts but worry about the confidentiality, and this feature can be perfectly used by them.

While some of the mediation roles of instant messaging apps are fulfilled, there are still some important mediating features are less considered. For example, only 6 out of the 24 instant messaging apps provide features of looking for and talking to strangers online. What's more, the fluidity on instant messaging apps is less stressed. Only 4 apps have features enabling users to withdraw their messages, or send messages that will be automatically deleted after seen.

The results of the first study give an answer to the first research question. The features on instant messaging apps influence users' involvement into group chat; provide ways for users to talk to strangers and keep the chat records; allow users to embrace more fluidity during the communicating process; as well as offer more options for users to protect or share their private information. Although some of the features are widely developed on instant messaging apps, some still need to be drawn more attentions on. The results will also be used for the second study on users' appropriation of instant messaging apps.

4. Study 2: Appropriation of Instant Messaging Apps

4.1 Method

4.1.1 Research Design

The purpose of Study 2 is to investigate the effect of cultural differences on users' appropriation of the instant messaging apps between Chinese and Dutch. An online survey was designed, in which participants from China and the Netherlands answered the questions related to their usage behaviours of instant messaging apps.

4.1.2 Instrument

In the questionnaire of Study 2, constructs are defined in order to investigate people's usage of instant messaging apps. For all the measurement items, a five-point Likert scale was adopted, with anchors ranging from strongly disagree (1) to strongly agree (5). All items are listed in Appendix I.

The questionnaire contained four parts: (a) introductory information; (b) demographic information; (c) size of network; and (d) appropriation of instant messaging apps.

The introductory questions served the purpose of explaining the basic information and the purpose of the online survey to participants, and informed participants to answer the questionnaire honestly. The demographic questions obtained basic instant messaging usage information of participants, such as age, gender, nationality, and currently residence. The size of network collected data of basic instant messaging communication of participants, for example, how many different instant messaging apps they use, which instant messaging apps they use, and numbers of contacts on their instant messaging apps. The last part, which is also the main part of the questionnaire, tested participants' appropriation on instant messaging apps. As discussed previously of the conceptual model, there are 10 constructs of features on instant messaging apps, divided into three categories of group/individual, implicit/explicit, and facework. They are: group chat, strangers, daily life, and dependency; record keeping, and fluidity; privacy, personality, sharing personal info, and sharing confidential info. Table 4 shows the definitions of each construct and their example questions. The questionnaire was originally designed in English. However, concerning about Chinese participants in China, the questionnaire was translated to Chinese. Then, a different person back translated it into English. To make sure the Chinese version and English version conveyed the same meaning, a few words were modified in the original version. Pre-tests were conducted to ensure no misunderstandings of the meaning for both Chinese and Dutch.

Constructs	Definitions of this study	Example questions	No. of
			items
	Group versus Inc	lividual	
Group chat	Participants' perceptions and attitudes toward the impact of	Having a group chat is very convenient.	7
	group chat and their importance in the maintenance of offline relationships.	Having a group chat is important to maintain the relationships between friends.	
Strongorg	Participants' tandonay and	I would like to shot with	4
Strangers	attitudes toward knowing new	people I don't know on	4
	apps.	instant messaging apps.	
Daily life	Participants' using behaviors	I often use my instant	12
	instant messaging apps in daily life.	a meeting.	
Dependency	To what extent participants rely on their instant messaging	I cannot imagine a life without instant messaging	8
	apps.	anymore.	
D 1	Implicit versus E	Explicit	10
keeping	keeping and using chat history	history with others.	10
1 0	on instant messaging apps.	It is ok for me that others	
		keep their chat history with me.	
Fluidity	Participants' attitudes towards features that could keep the conversation fluid on instant	I want to be able to withdraw my messages.	v 8
	messaging apps.		
Drive	Facework	It is als far me that all a	10
Privacy	attitudes toward privacy issues on instant messaging apps.	It is ok for me that others know when I read their messages.	10

Table 4 Constructs definitions and number of items measured

		read my messages.	
Personality	Participants' awareness and attitudes toward differences between participants' online personality and true	My online personality is different from my true personality.	8
	personality.		
Personal info	Participants' willingness to share their personal information on instant messaging apps.	It is ok for me to share my real name with all my online contacts.	8
Share info	Participants' attitudes toward sharing problems in offline world with online contacts on instant messaging apps.	If I have relationship problems, I will discuss them with some of my contacts on instant messaging apps.	10

4.1.3 Participants

Three groups of people participated in the online survey: Chinese who live in China, Chinese who live in the Netherlands, and Dutch. The original goal was to reach 50 participants for each group. In the end, 229 participants in total responded to the online questionnaire, while 193 of them provided complete and valid answers. Among the valid participants, 59 are Chinese participants in China, 55 are Chinese participants in Holland, and 79 Dutch participants. The target group of the participants is people around 18-35 years old, since young generation is the largest user groups of instant messaging apps. The gender balance was required from the beginning, and finally we got 84 male participants and 109 female participants, which meets the needs of balanced gender. The average educational background of the participants is high, most of which hold a bachelor or higher degree, since the online questionnaire was spread among students in the universities. The surveyed people had abundant experience of using at least one of the most popular instant messaging apps: WhatsApp, WeChat, QQ, Skype, etc.

4.1.4 Procedures

The questionnaire was implemented online. It was generated by an online tool 'Qualtrics'. The data of Chinese in China were collected by sending the link to Chinese people who live in China, the data of Chinese in Holland were collected by sending the link to Chinese people who live in the Netherlands, and the Dutch data

were collected by sending link the link to Dutch people as well as from students who registered on SONA system at University of Twente in the Netherlands.

First of all, respondents were informed that their answers for the questionnaire would be processed anonymously. We expected for honest answers in doing this. Then, an introduction was given about the goal of the questionnaire to avoid confusion. The questionnaire was answered around 15 minutes.

4.1.5 Data Analysis

After data collection, the following analyses were performed: 1) exploratory factor analysis was conducted to assess the reliability and construct validity; 2) analysis of variance was used to analyze differences between three groups. Post-hoc test was used to compare specific cultures when an overall ANOVA was significant; 3) multiple regression analysis using SPSS was used to analyze the differences among the three groups.

4.2 Results

4.2.1 Scale Construction

An exploratory factor analysis was conducted through computing measures of sampling adequacy. Items with low factor loadings were undertaken reduction (Dlodlo, 2015). The minimum cut-off of 0.40 was used. This is consistent with Hair, William, Babin, and Anderson (2010) who suggested that factor loadings higher than ± 0.30 are considered to meet the minimum levels, loadings of ± 0.40 are considered important, and loadings of ± 0.50 and higher are deemed more important. Therefore, some questions for certain constructs were excluded from the future analysis.

In addition, Kaiser's (1970) eigenvalues greater than 1 criteria, percentage of variance explained, and the scree plot guided the extraction of factors (Dlodlo, 2015). The results led to the final decision to retain 16 component, labelled as daily life work related, daily life leisure time, strangers, dependency addiction, dependency check many times, personality, privacy self, privacy others, share confidential info, personal info, share easy, group chat easy, group chat maintain, fluidity, record keeping self, and record keeping others.

Reliability of the constructs was ascertained by computing the Cronbach's alpha coefficient values. According to Nunnally (1978), Cronbach's alpha coefficients of

less than 0.60 are regarded as unsatisfactory; vales between 0.60 and 0.69 are considered acceptable, and values above 0.70 are assumed to be highly acceptable. The reliability values in this study are in the following order: personality (0.90), strangers (0.88), record keeping others (0.84), share easy (0.83), record keeping self (0.82), dependency addiction (0.81), privacy others (0.81), personal info (0.81), share confidential info (0.80), fluidity (0.80), privacy self (0.77), dependency check many times (0.75), group chat easy (0.75), daily life work related (0.75), group chat easy (0.75), daily life work related (0.75), group chat construct reliability statistics can be referred to Appendix II.

4.2.2 Comparison of Demographic Factors

The distributions of demographic factors of the participants are shown in Table 5. The average age of the participants is 23.35, which means the survey was spread mostly among young people. There were more female participants than male participants, while the number of male participants is still enough for the further analysis.

	e 1	· ·			
		Dutch	Chinese in	Chinese in	Total
			NL	CN	
Age	M (SD)	21.13 (2.75)	24.53 (3.93)	25.24 (4.55)	23.35 (4.15)
Gender	Male	25	31	28	84
	Female	54	24	31	109
Total		79	55	59	193

Table 5 Demographics of respondents (N = 193)

Then, an analysis was conducted using a multivariate ANOVA. Independent variables in the analysis were (a) Culture Group, (b) Gender, and (c) Age. The test results may be found in Table 6 (multivariate test results). As can be seen from the Table 6, significant multivariate differences were found for culture group and gender. No differences were found for ages, and interaction effects for culture group and gender. The results illustrate that in this study the age of participants has no impact on their appropriation of instant messaging apps. In addition, Chinese and Dutch female participants have similar attitudes toward the appropriation of instant messaging apps, the same fact goes with Chinese and Dutch male participants.

	Wikis's λ	F	df	Significance	η ²	
Culture group	0.45	4,807	32,000	<i>p</i> < 0.001	0.31	
Gender	0.80	2,673	16,000	p = 0.001	0.20	
Age	0.92	,881	16,000	p = 0.592		
Group * Gender	0.82	1,111	32,000	p = 0.316		

Table 6 Multivariate Test Results for constructs on instant messaging apps

In order to find out which aspects of the appropriation of instant messaging apps were affected by gender, an analysis of between-subjects effects was conducted. Table 7 shows that female and male participants, no matter from which culture group, have a different level on the dependency on instant messaging apps, as well as different attitudes toward talking to strangers, group chat, and record keeping. According to the results of this study, female instant messaging users showed a higher level or dependency on instant messaging apps, they inclined to agree with the idea that they would feel bad if they cannot get access to their instant messaging apps. Female instant messaging users showed a stronger opinion against talking to strangers on instant messaging apps than male users. As for using instant messaging apps to maintain relationships with others, female participants held slightly more positive than male participants, and they felt more acceptable for others keeping their chat history.

η ² FSignificance df 0.08 Dependency addiction 9,457 *p* < 0.001 p = 0.0055,851 0.04 Strangers 1 Group relation 2,110 p < 0.050.02 1 Record keeping others p < 0.051,871 1 0.03

Table 7 Between-Subjects effects on instant messaging apps for gender

Note: Only significant variables are included in this table.

4.2.3 Differences in the Use of the Instant Messaging Apps

A descriptive statistical analysis was used to summarize the differences in the basic use of instant messaging apps among three groups. The difference in the numbers of contacts on the mostly used instant messaging apps was not significant, p = 0.37. However, Chinese tended to have more online contacts than Dutch, especially Chinese in the Netherlands.

Significant difference was found for numbers of apps people are using. The result showed that Chinese in the Netherlands are using more different kinds of apps, M = 4.05, SD = 1.34, while for Dutch, M = 2.80, SD = 1.04, for Chinese in China, M = 2.80, SD = 1.30. It can be understood that Chinese in China have access to more apps both from western countries and eastern countries. Take WeChat and WhatsApp as examples, in China, almost everyone uses WeChat, however, people have rarely heard of WhatsApp. On the contrary, in the Netherlands, most of the people are using WhatsApp instead of WeChat.

The mostly used instant messaging apps were varied in the three groups. For Dutch, WhatsApp and Facebook Messenger were the mostly used instant messaging apps, Skype ranks the third one after them. WeChat is the most popular instant messaging apps for both Chinese in the Netherlands and Chinese in China. Chinese in China also used QQ Mobile very often. Chinese in the Netherlands also use Facebook Messenger and WhatsApp very often. The using frequency of each app can be found from the Appendix III.

4.2.4 Cultural Differences on Appropriation of Instant Messaging Apps

Regarding the culture group, significant differences were found in the constructs. Hence, an analysis of between-subjects effects was conducted for different culture groups. Table 8 shows which aspects of the appropriation of participants on instant messaging apps were affected by cultures.

5		0 0 11		
	F	df	Significance	η ²
Dependency check many times	10,268	2	<i>p</i> < 0.001	0.10
Personal info	9,021	2	<i>p</i> < 0.001	0.09
Personality	12,777	2	<i>p</i> < 0.001	0.12
Private self	7,698	2	p = 0.001	0.08
Sharing easy	11,143	2	<i>p</i> < 0.001	0.11
Group relation	13,438	2	<i>p</i> < 0.001	0.13
Fluidity	14,725	2	<i>p</i> < 0.001	0.14
Record keeping self	8,644	2	<i>p</i> < 0.001	0.09
Record keeping others	7,529	2	p = 0.001	0.08

Table 8 Between-Subjects effects on instant messaging apps for culture group

Note: Only significant variables are included in this table.

From the results above, it is found that difference cultures have different appropriation on dependency check many times, share personal info, personality, private self, share easy, group chat maintain relationships, fluidity, record keeping self and others. To find further differences among the three groups of people, post hoc tests were conducted. Table 9 shows the results of the tests.

Constructs		Subset	
	Dutch	Chinese in NL	Chinese in CN
Group easy to use	3.71 ^a	3.43 ^b	3.66 ^{ab}
Group relation	2.89 ^a	3.47 ^b	3.62 ^b
Strangers	2.44	2.76	2.80
Daily life work	2.51 ^a	2.60^{ab}	2.79 ^b
Daily life leisure	3.27	3.26	3.33
Dependency addiction	3.19	3.33	3.44
Dependency check many times	3.18 ^a	3.62 ^b	3.86 ^b
Record self	3.37 ^a	3.88 ^b	3.97 ^b
Record others	3.51 ^a	3.91 ^b	3.85 ^b
Fluidity	3.07 ^a	3.42 ^b	3.69 [°]
Privacy self	3.24 ^a	2.80 ^b	2.88 ^b
Privacy others	3.33	3.34	3.46
Personality	2.11 ^a	2.85 ^b	2.77 ^b
Personal info	3.02 ^a	2.81 ^a	2.48 ^b
Sharing easy	2.28 ^a	2.90 ^b	3.03 ^b
Sharing confidential info	3.03	2.96	3.15

Tał	ole	9	Post	hoc	tests
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Note: ^{a, b,} and ^c represented the means for groups in homogeneous subsets.

Group versus Individual

From the results above we can see that all three groups of people hold positive attitude group chat, considering it provides more conveniences and pleasant feelings to the users. In the meantime, significant differences were found between Dutch and Chinese. Chinese, both in the Netherlands and in China, believe that group chat plays an important role in maintaining their relationships with friends, family members, and classmates/colleagues. Dutch seems to see less importance in the role group chat plays in their relationships with other people. Hence, the first hypothesis, indicating that Chinese participants have a more positive attitude toward group chat on instant messaging apps than Dutch participants, was supported.

The results showed no significant differences between Chinese users and Dutch users in talking to strangers on instant messaging apps. However, the results indicated that Chinese seems to be more open to talk to people they do not know.

The hypothesis 3 and hypothesis 4 were also supported by the results. Chinese participants have a more positive towards using instant messaging apps in daily life, and they depend on instant messaging apps more than Dutch participants. For hypothesis 3, although all three groups of people showed the same level of acceptance of using instant messaging apps in leisure time in daily life, Chinese seem to be more inclined to use instant messaging apps during face-to-face communications in class/at work/in a meeting. With regard to hypothesis 4, although no significant difference was found in the addiction to instant messaging apps, Chinese users do check their instant messaging apps more frequently than Dutch, which means Chinese depend on instant messaging apps more heavily than Dutch.

It can be concluded that the cultural differences between group and individual, which is affected by the cultural dimension of individualism and collectivism, do have impact on the way people establishing and maintaining their social interaction by instant messaging apps.

Implicit versus Explicit

Hypothesis 5 was supported by the results, which indicating that Chinese have higher level of appropriation of the fluid features on instant messaging apps.

The results for the two sides of record keeping are alike, showed that Chinese were more willing to keep or use their chat history with their contacts, and show more tolerance for others to keep or use their chat history. It can be explained that for Chinese users with a higher level of appropriation of the fluid features on instant messaging apps, they care less whether others keep their chat history on the devices or not.

Therefore, it is still obvious to see that the implicit and explicit cultural differences influenced by high-context and low-context cultural dimension have effect on the ways people using instant messaging apps to communicate with each other.

Facework

Significant difference was showed in the result between Chinese and Dutch concerning the self-side of privacy issues. It seems that Dutch were more open to let others to know their private status, whereas Chinese emphasized their privacy more on instant messaging apps. The results showed that both Chinese and Dutch want to know more about their online contacts' private status. Hence, the hypothesis 7 of Chinese participants concern more about protecting privacy on instant messaging apps than Dutch participants was supported.

To compare online personality with offline personality, Chinese participants do think they are different, and their online personality might be a better version of their real personality in real life. Therefore, hypothesis 8 was supported. Chinese participants believe more that their online personality is different with their true personality than Dutch participants.

The results showed that Chinese participants in China were more reluctant to share their personal information with their online contacts. However, Chinese participants in the Netherlands and Dutch were more open to share this kind of information on instant messaging apps. The hypothesis 9, Dutch participants have a more positive attitude towards sharing personal info on instant messaging apps than Dutch participants, could be supported by the results.

Both Chinese and Dutch hold a neutral view to share confidential problems with their contacts on instant messaging apps. However, Dutch people showed the inclination to disagree with the idea of sharing the confidential problems on instant messaging apps is easier than face to face. Thus, hypothesis 10 was supported that Chinese participants feel easier to share confidential information on instant messaging apps than Dutch participants.

The facework affected by individualism and collectivism dimension, as well as high-context and low-context cultural dimension has effect on the degree to what extent people would like to share to people during social interacting events when using instant messaging apps.

4.2.5 Dependency on Instant Messaging Apps

Another analysis focused on the relationship between users' appropriation of features and their dependency on instant messaging apps. To investigate this, a stepwise regression analysis was conducted. The dependent variable in this analysis was dependency addiction, and the personal info, personality, privacy self, privacy others, sharing easy, group relation, fluidity, record keeping self and record keeping others were used as the independent variables. Table 10 presents the results of this

analysis. From Table 10 we could see that only two of the constructs appeared to have significant impact on participants' dependency on instant messaging apps, which are personality and privacy others. It could be assumed from the results that participants who think that their online personalities are different with their true personalities are more dependent on instant messaging apps. What's more, participants who were more inclined to invade other people's privacy showed more dependency on instant messaging apps. As we found out before, gender also has an impact on users' dependency on instant messaging apps. Female participants seem to rely on instant messaging apps more heavily than male participants.

Table 10 Multiple regression analysis on dependency

	Beta	Significance	Adjusted R ²	
Personality	0.28	p = 0.001		
Privacy others	0.28	p < 0.001		
-		-	0.26	

Note: F = 5,683, p < 0.001.

5. Discussion

5.1 Main Findings

Various conclusions may be drawn on the basis of the results of this study. First of all, the great numbers of diverse features on instant messaging apps play different mediating roles on users' online communication. Some of the features are less stressed and developed on existing instant messaging apps, such as fluidity features. In the available researches so far, it is proved that the openness for many use purposes and active roles of the user in finding the most appropriate ways to use the different functionalities embodied in the technologies are important (Huysman et al., 2003; Williams, Stewart & Slack, 2005). Some features may be through uneasy adaptation (House et al., 2004), and early adopters' expectations about new technologies do not always match its usefulness in social settings (Oksman, 2005).

Another remarkable outcome of this study is that significant cultural differences were found in how Chinese and Dutch use instant messaging apps. By combining Hofestede's (1994; 2001) and Hall's (1977) cultural dimensions of individualism versus collectivism and high-context versus low-context, Chinese and Dutch were

marked as different in group/individual, implicit/explicit, and facework. It was assumed that Chinese stress group more than Dutch, and the results of the study supported the assumption. Compared to Dutch users, Chinese users are also more willing to use group chat on instant messaging apps to maintain relationships, more acceptable with the use of instant messaging apps in daily life, and more dependent on instant messaging. What's more, Chinese culture values the implicit way to communicate, while Dutch culture emphasizes the explicit way of interacting. Therefore, it was expected that Chinese users have a higher level of acceptance with record keeping, fluidity and more than text communicating features on instant messaging apps. The results proved the first two expectations, indicating that Chinese users have higher possibilities to use fluidity features and record keeping on instant messaging apps. It is also noted that under the impact of cultural dimensions, Chinese people and Dutch people share different aspects of needs and concerns for facework. Chinese people, on the one hand, have other-positive and other-negative facework; on the other hand, Dutch people have self-positive and self-negative facework. These were supposed to affect users' attitudes toward privacy, personality, sharing personal info and sharing confidential info. According to the results, Chinese participants are more sensitive about their privacy. In the mean time, they are more interested into invading others' privacy than Dutch participants. This contradictory result may be explained by Chinese people's 'middle way' perspective, which is the worldview of harmony (Chen, 2002). The results also showed that Chinese people like their online personality than their true personality more than Dutch. In addition, Chinese will share their personal info on instant messaging apps less than Dutch. Although not significant, it was still found that Chinese people hold a more positive attitude toward the convenience of sharing confidential information on instant messaging apps.

The third findings of this study is that people who believe their online personalities are different with their true personalities, and people who are more inclined to invade others' privacy, will depend on the use of instant messaging apps more. Gender difference is also found in the dependency on instant messaging apps regardless of cultures. Female participants expressed more bad feelings for living without instant messaging apps, and showed more signals that they could not imagine a life without instant messaging apps. This finding of gender differences is aligned with several researches. For instance, Herring (2003) has reported that in general, females tend to send short messages, and more likely to justify their statements, express support to others, whereas male are more inclined to send relatively long messages, and express their opinions strongly. Furthermore, female type three times as many representations of smiles, while males use more aggressive speech acts.

Last but not least, the cross-cultural adaptation is also found in the results. Among the three groups of participants, which are Chinese in China, Chinese in the Netherlands, and Dutch, it is obvious to see that Chinese in the Netherlands show similarities with both Chinese in China and Dutch. These views of the three groups of people might be explained by the theory of cross-cultural adaption. With the development of cross-cultural communication, more people get opportunities to live or study in a foreign country. Such people must have noticed the cultural differences between different countries, and be aware of their impact on daily life. Culture is often seen as a border between people. However, different cultures can also be integrated, it is possible for people from another culture to adapt the new culture of the country they current live. The use of instant messaging apps between two Chinese and Dutch cultures could also be interpreted by the cultural adaption theory. According to cultural adaption theorist Wilkelman (1994), Chinese who live in the Netherlands may result differently both with Dutch as well as Chinese who live in China, they are very likely to be in between.

5.2 Theoretical Implications

From a theoretical perspective, this research first provides the mediation roles of features on instant messaging apps. Although there are a plenty of studies on the use of instant messaging apps, very limited research has been done to investigate the features on instant messaging apps mediate users. The results of the first study give the first comprehensive classifications on the features of instant messaging apps, including basic features of instant messages, video, images, file management, talk, services, as well as advanced features of group chat, strangers, message management, record keeping, contact management, personal profile and privacy management. These features have an explicit impact on the way people maintain their group relationships, the way they get to know new people, the way they chat online, and the way they share their personal and confidential info. They may also contain an implicit effect on the way people communicate face-to-face, influence people's daily life, and

change people's communicating behaviours. Although it might not comprehensively cover the use of all features on instant messaging apps, it is meaningful for other scholars to keep studying the mediations of instant messaging apps on the way people communicate and maintain their social life.

Another important theoretical contribution of this study is that it identified the significant effects of cultural differences on the appropriation of instant messaging apps. It may contribute to the enrichment of cultural differences in Western and Eastern world. The study explores the cultural differences between Western and Eastern based on Hofstede's Individualism versus Collectivism dimension and Hall's High-Context and Low-Context dimension. It came up a model of the relations between cultural dimensions and instant messaging apps. The model of this study indicates Chinese and Dutch cultures have differences in dimensions of group versus individual, implicit versus explicit, and facework. The dimension of group versus individual affects users appropriation of group chat and talking to strangers on instant messaging apps, also influence their use of instant messaging apps in daily life and to what extent they rely on instant messaging apps. The dimension of implicit versus explicit has an effect on users' appropriation of fluidity features as well as record keeping features. The facework dimension affects users' willingness to share their personal and confidential info online, and their awareness of privacy and their online personality. These three dimensions could be used in future researches to study on users' appropriation on more features.

In addition, this study also provides a clue of the effect of gender on the appropriation of instant messaging apps. It shows that gender differences do exist among the use of instant messaging apps. Therefore, future studies could be taken to explore more aspects of differences under gender dimension.

Lastly, the study explored the relations between the appropriation and dependency on instant messaging apps. Results showed that people who believe that their online personalities are different with their offline personalities, and cares more about other people's privacy, have a higher degree of addition to instant messaging apps. Future studies could focus on the factors that affect users' dependency on instant messaging apps.

5.3 Practical Implications

The main findings from this study have clear practical implications for the design of future instant messaging apps. First of all, with the developing need for a fluid conversation, the designers should consider to introduce more features to the apps, such as withdraw messages. The way to meet and talk to strangers should also be expanded on instant messaging apps, allowing users to find people nearby, or share the similar interests with them. The findings of cultural differences on the appropriation of instant messaging apps may lead designers to consider the features differently according to different cultures. For example, when tailor an app targeting Chinese users, the feature of users' online status could be controlled by users. In conclusion, the results of this study may be useful for designers to better understand their users from different cultural groups.

5.4 Limitations of This Study

Although carefully designed and executed, some limitations of this study may still affect the results. First of all, 193 participants were involved for the online survey, and most of them have high educational level. Therefore, the study results cannot be representative of all kinds of users. Moreover, some participants had negative feedback on the numbers of questions of the questionnaire, and it could affect the credibility of the participants' answers. The questionnaire was released on the Internet without the presence of the research, so some participants may fill out the form without enough patience and attention. Some may have understanding problems with the lack of help and explanation from the researcher. Also, the online questionnaire was conducted in English for Dutch participants, which was not the mother tongue of them. Although Dutch are commonly considered as having a good command of English, it will still be more precise to conduct a Dutch version of online survey in the future.

5.5 Conclusion

Previous studies have shown that the use of instant messaging apps might be influenced by cultural differences. Therefore, many efforts have been made to build the relationships between cultures and the use of instant messaging apps in terms of culture models, among which Hofstede's cultural dimensions and Hall's cultural dimensions were mostly used. However, no sufficient studies have been carried out to map the cultural differences and specific features on instant messaging apps. Hence, this study conducted an online questionnaire and recruited 193 participants from China and the Netherlands to elicit their attitudes towards specific features on instant messaging apps. Results showed that cultural dimensions do influence people's attitudes toward features on instant messaging apps in aspects of group/individual, implicit/explicit, and facework.

What the results of this study shows is the need for a better understanding of different mediating effects of different features on users, and the factors that may influence users' appropriation of instant messaging apps. Cultural differences between Western and Eastern seem to be a considerable importance factor.

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Appendix I Questionnaire in Study 2

Part 1: Introduction of the questionnaire

Part 2

General questions:

- 1. What is your gender?
- 2. What is your nationality?
- 3. Where do you live currently?
- 4. What is your age?

Size of network:

- 1. How many different instant messaging apps do you use?
 - 1. Which of the following instant messaging apps do you use?
- 2. Can you estimate how many contacts do you have on the important messaging app you use most?

Daily life

I often use my instant messaging apps when I am:

- 1. in class or at work
- 2. in a meeting
- 3. talking with other people face to face
- 4. walking on the street
- 5. watching television
- 6. having meals

Daily life (others side)

It is ok for me that others user their instant messaging apps when they are:

- 2. in class or at work with me
- 3. in a meeting with me
- 4. talking with me
- 5. walking on the street
- 6. watching television with me
- 7. having meals with me

Dependency on IM

- 1. I cannot imagine a life without instant messaging apps.
- 2. I would feel bad if don't have access to my instant messaging apps.
- 3. I communicate more using my instant messaging apps than face to face.
- 4. I feel somewhat addicted to my instant messaging apps.
- 5. I check my instant messaging apps many times during a day.
- 6. Checking my instant messaging apps is the first thing I do in the morning.
- 7. Checking my instant messaging apps is the last thing I do before sleeping.
- 8. When I wake up at night, I check my instant messaging apps.

Personal info:

It is ok for me to share the following information with all my contacts on instant messaging apps:

- 1. my real name
- 2. my age
- 3. a clear photo of myself
- 4. my address
- 5. my phone number
- 6. my relationship status
- 7. my contact list
- 8. my location

Personality:

- 1. My online personality is different from my true personality.
- 2. I don't reveal all aspects of my true personality in my online personality.
- 3. I like my online personality more than my true personality.
- 4. My online personality is more sociable than my true personality.
- 5. I am more spontaneous online than in real life.
- 6. I am more open online than in real life.
- 7. It is easier for me to communicate online than face to face.
- 8. My online personality is better than my true personality.

Privacy:

It is ok for me that my contacts on instant messaging apps:

- 1. know when I read their messages
- 2. know when I delete them from my contact list

- 3. know when I block them from my contact list
- 4. see my online status
- 5. know my last online time

Privacy (other side):

I want to know the following information about my contacts on instant messaging apps:

- 1. when others read my messages
- 2. when others delete me from their contact list
- 3. when others block me from their contact list
- 4. their online status
- 5. their last online time

Strangers:

- 1. I would like to chat with people I don't know on instant messaging apps.
- 2. I would like to meet new people using my instant messaging apps.
- 3. I would like to make new friends using my instant messaging apps.
- 4. I only want to use my instant messaging apps with people I know.

Sharing confidential info with others:

If I have the following problems, I will discuss them with some of my contacts on instant messaging apps:

- 1. relationship problems
- 2. financial problems
- 3. health issues
- 4. study or work related problems.
- 5. My crush on someone

I would find it easier to discuss the following problems on instant messaging apps than face to face:

- 6. relationship problems
- 7. financial problems
- 8. health issues
- 9. study or work related problems.
- 10. My crush on someone

Group chat:

1. I often use group chat in instant messaging apps.

- 2. Having a group chat is very convenient.
- 3. Having a group chat is very pleasant.
- 4. Having a group chat is very efficient.
- 5. Having a group chat is important to maintain the relationships between friends.
- 6. Having a group chat is important to maintain the relationships between family members.
- 7. Having a group chat is important to maintain the relationships between colleagues or classmates.

Fluidity:

In my instant messaging apps, I want to be able to:

- 1. withdraw my messages
- 2. send a message that will expire in several seconds
- 3. send a message that will be deleted automatically after seen
- delete certain messages from our chat history from my contacts' instant messaging apps

Fluidity (others side):

It is ok for me that my contacts can:

- 1. withdraw their messages
- 2. send a message that will expire in several seconds
- 3. send a message that will be deleted automatically after seen
- 4. delete certain messages from our chat history from my instant messaging apps

Record keeping:

In my instant messaging apps, I would like to:

- 1. keep my chat history with contacts
- 2. save my chat history with contacts as a file on my computer
- 3. check my chat history with contacts
- 4. search my chat history with contacts by key words
- 5. use my chat history to confront contacts with things they said before

Record keeping (others side):

It is ok for me that my contacts:

- 1. keep their chat history with me
- 2. save their chat history with me as a file on their computer
- 3. check their chat history with me

- 4. search their chat history with me by key words.
- 5. use their chat history to confront me with things I said before

Appendix II Factor Analyses in Study 2

Table 11 Factor Analyses in Study 2

Measured items	Factor Construct loading	Cronbach's alphas	
	scores		
Daily life I		0.75	
DLS_meeting	0.70		
DLO_meeting	0.68		
DLS_talking	0.66		
DLO talking	0.55		
DLO classwork	0.52		
DLS classwork	0.47		
Daily life II		0.66	
DLO tv	0.63		
DLO meals	0.63		
DLS_street	0.61		
DLS_tv	0.61		
DLS meals	0.58		
DLO street	0.76		
Strangers		0.88	
STRAN newpeople	0.90		
STRAN newfriends	0.87		
STRAN dontknow	0.83		
STRAN ikonwREC	0.71		
Dependency I		0.81	
DEP imagine	0.73		
DEP feedbad	0.68		
Dependency II		0.75	
DEP checkmorning	0.73		
DEP checkwakeup	0.72		
DEP checksleeping	0.71		
DEP checkmanytimes	0.64		
DEP addicted	0.62		
Personality		0.90	
PERS sociable	0.84		
PERS spontaneous	0.82		
PERS open	0 74		
PERS better	0 74		
PERS easier	0.73		
PERS likemore	0.73		
PERS different	0.55		
Privacy self		0.77	
PRIVS onlinestatus	0.85	,	
	0.00		

PRIVS_lasttime	0.79
PRIVS_whenread	0.70
PRIVS_delete	0.80
PRIVS_block	0.78
Privacy others	
PRIVO_lasttime	0.72
PRIVO block	0.71
PRIVO whenread	0.70
PRIVO delete	0.68
PRIVO onlinestatus	0.68
Sharing confidential info	
with others	
SHAR relationship	0.88
SHAR crush	0.77
SHAR health	0.70
SHAR financial	0.56
Personal info	
INFO name	0.86
INFO age	0.83
INFO photo	0.82
INFO phone	63
INFO relation	5.3
INFO contactlist	0.76
INFO location	0.75
INFO address	0.50
Share easy	
SHAR EAS financial	0.75
SHAR EAS health	0.73
SHAR EAS relationship	0.64
SHAR EAS crush	0.64
Group chat easy	0.01
GROUP efficient	0.76
GROUP convenient	0.75
GROUP pleasant	0.69
GROUP oftenuse	0.65
Group chat maintain	0.02
GROUP maintainfamily	0.70
GROUP maintainfriends	0.69
GROUP maintaincollegues	0.64
Fluidity	0.01
FLUIDO deleteautomatically	0 79
FLUIDO expire	0.78
FLUIDS expire	0.78
FLUIDS_deleteautomatically	0.63
FLUDO withdraw	0.03
FLUIDS withdraw	0.44
Percent learning colf	0.38
DECKS chockbistory	0.70
NECKS_coerchhistory	U./7 0.70
NECKS_searchistory	U./Y
KELKN SAVENISTORV	0.00

0.81

0.80

0.81

0.83

0.75

0.73

0.80

0.82

RECKS_keephistory 0.5	5
Record keeping others	0.84
RECKO_checkhistory 0.9	1
RECKO_keephistory 0.8	6
RECKO_searchhistory 0.7	1
RECKO_savehistory 0.7	8

Appendix III Usage Frequency of Apps

Table 12 Usage Frequency of Apps

		Dutch	Chinese in NL	Chinese in CN	Total
Estimated numbers of contacts	M (SD)	122.14 (211.58)	323.07 (1022.33)	211.95 (214.57)	206.86 (576.96)
Numbers of instant messaging apps	M (SD)	2.80 (1.04)	4.05 (1.34)	2.80 (1.19)	3.16 (1.30)
Mostly used instant messaging apps	WeChat WhatsApp Facebook Messenger	1 (1.27%) 77 (97.47%) 68 (86.08%)	54 (98.18%) 35 (63.64%) 43 (78.18%)	59 (100.00%) 8 (13.56%) 9 (15.25%)	114(59.07%) 120 (62.18%) 120 (62.18%)
чЪЪр	Skype KakaoTalk Viber Kik Telegram QQ Mobile EasyChat iCall AppMe SnapChat ICQ Yahoo Messenger	33 (41.77%) 1 (1.27%) 2 (2.53%) 3 (3.80%) 7 (8.86%) 1 (1.27%) 22 (27.85%) 0 0 0	26 (47.27%) 2 (3.64%) 3 (5.45%) 1 (1.82%) 38 (69.09%) 3 (5.45%) 1 (1.82%) 1 (1.82%) 1 (1.82%) 2 (3.64%)	9 (15.25%) 2 (3.39%) 2 (3.39%) 53 (89.83%) 8 (13.56%) 1 (1.69%) 1 (1.69%) 1 (1.69%) 1 (1.69%) 1 (1.69%)	68 (35.23%) 5 (2.59%) 7 (3.63%) 3 (1.68%) 8 (4.15%) 92 (47.67%) 11 (5.70%) 1 (0.52%) 1 (0.52%) 24 (12.44%) 4 (2.07%) 3 (1.68%)
	Line Others	2 (2.53%) 4 (5.06%)	6 (10.91%) 7 (12.73%)	6 (10.17%) 3 (5.08%)	14 (7.25%) 14 (7.25%)