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# How Media and Behavioral Characteristics of Mobile Instant Messenger Affect Intimacy and Fatigue? The Moderating Effect of The Communication Context

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## ABSTRACT

Mobile instant messenger has become a part of our daily life because a smartphone is the primary communication device. To communicate other friends, they use a mobile instant messenger more frequently than giving a phone call. This study aims to investigate why people communicate others through a mobile instant messenger based on media and behavioral characteristics, which affect intimacy and fatigue. We expect this study would contribute for understanding the communication with a mobile instant messenger.

*Keywords:* Mobile Instant Messenger, Media Synchronicity Theory, Mobile Communication, Intimacy, Fatigue.

## INTRODUCTION

Nowadays it is hard to find smartphone owners who do not use a mobile instant messenger service. Since a smartphone became popular, a mobile instant messenger service (e.g., KaKaoTalk, WhatsApp, WeChat, etc.) has been one of the most commonly used applications in the world. Typical behavioral patterns in the communication might be to leave a message through a mobile instant messenger, rather than a phone call. Many people prefer communicating with a mobile instant messenger to directly talking on the phone even though a phone call is more clear and fast way to deliver a message than a mobile instant messenger. Thus, it is necessary to investigate why people use a mobile instant messenger for communicating others. Many prior researches about a mobile messenger have been conducted based on Technology Acceptance Model (TAM) or Theory of Planned Behavior (TPB), which used typical variables such as perceived usefulness, perceived ease of use, intention to use, and etc [2, 10, 18, 21, 24, 33, 36, 37]. These researches was meaningful when the target product was in the early stage, but if it was in the mature stage, a different approach would be more appropriate. This study mainly focused on the communication with a mobile instant messenger rather than intention to use it. To the end, we investigated how media and behavioral characteristics of a mobile instant messenger would influence intimacy and fatigue based on media synchronicity theory and other prior researches

## LITERATURE REVIEW

### Media Synchronicity Theory

There are two media theories that explain the role and the effectiveness of the media in the communication process; one is media richness theory, and the other is media synchronicity theory. Media richness theory [11] argued that every communication media has different ability to reproduce information sent over it, so the degree of this ability known as a media richness influences the communication among users. In other words, the performance and the quality of the communication would be determined by how clear information delivered by a media is. Therefore, the main driver for choosing a communication media is to decrease possible misinterpretation of messages or information. Dennis and Valacich [13] proposed an alternative media theory – media synchronicity theory because media richness theory was not good enough to explain why to select one media over others. Synchronicity refers to a state in which “individuals are working together at the same time with a shared pattern of coordinated behavior [12],” so media synchronicity theory argued that communication would be improved when selected media could appropriately support the synchronicity required by a communication process [12, 13].

Communication consists of two fundamental processes: conveyance and convergence. The conveyance process means that new information is transmitted and processed among communication participants (senders & receivers), so the conveyance process could be enhanced by using a media that has a low synchronicity. Because communication participants spend a certain amount of cognitive resource to read, understand, and integrate information, they should have enough time to process it. On the other hand, the convergence process refers to the process of mutually agreeing with the meaning of the information among communication participants, so required cognitive resource in the convergence process is less than that in the conveyance process. Because most information is already delivered and processed in the conveyance process, the convergence process would require relatively less time for reaching the mutual agreement and understanding among participants. If the main goal of communication is to delivery or distribute information to participants (conveyance process), a media with low synchronicity would be more appropriate. When, conversely, the main goal of communication is to make the mutual agreement (convergence process), a media with high synchronicity would be more appropriate [12, 13].

Media synchronicity theory has been used to explain how a media affect communication. For example, Cho et al. [9] examined the relationship between diverse media and communication overload, and argued that the synchronicity of media played an important role in communication overload. Ryoo and Koo [48] claim that employees could work, find solutions, and achieve their goals with ICT (information and communication technologies) because ICT is alternative source of knowledge creation, and it is moderated by media synchronicity. Chan [6] analyzed how university students used CMC (computer-mediated communication) technologies for interpersonal communication depending on their shyness and sociability, and found that shy

individuals were more likely to use low synchronous media. In general, media synchronicity theory figures out the characteristics of media based on the synchronicity and proposes the role of media in the communication, so this study would like to examine the mobile instant messenger service based on media synchronicity theory.

The communication performance could be enhanced by selecting appropriate media based on the characteristics and the goal of the communication, and media synchronicity theory argued that it would be plausible to figure out which media would be more appropriate than others based on the synchronicity. Media synchronicity is determined by five media transmission capabilities: transmission velocity (or immediacy of feedback), parallelism, symbol variety (or symbol sets), rehearsability, and reprocessibility [10, 11]. Transmission velocity (or immediacy of feedback) means how fast a message can be delivered to a recipient and how quickly he/she responds, so it can refer to the ability to support quick bidirectional communication. Parallelism refers to the number of conversation that can be co-exist effectively. For example, a mobile instant messenger is enable to take place many simultaneous conversations while a telephone can allow only one conversation at one time. Symbol variety (or symbol sets) is the variety of ways to express or communicate information. In other words, it means the number of ways that a information can be encoded in the communication. Rehearsability means that a sender can rehearse or examine a message before sending it out to a receiver, so some media, which have high rehearsability, gives a sender the opportunity to edit a message for ensuring the expression of the intended meaning. Reprocessibility refers to the ability to reexamine and process again a received message for better understanding or reference [12, 13]. Because there is no best medium to fit in every situation, communication performance would depend on the matching the synchronicity of a given media with a given situation.

### **Communication with Mobile Instant Messenger Service**

Since smartphone became popular, interpersonal communication with mobile internet has dramatically increased. SNS (social network service) would make individuals to interact with a variety of people, whom they have never met before, and mobile messenger services such as KaKaoTalk would provide many opportunities for communicating with a wide circle of friends and acquaintances more deeply and emotionally. Therefore, an explosion of mobile communication with a smartphone enables people to build or reinforce interpersonal relationship and intimacy [3, 5, 34, 49, 52]. For example, people would like to talk with others about even trivial things through a mobile instant messenger because they want to keep and strengthen the interpersonal relationship [20]. They create a virtual social space in a mobile instant messenger by exchanging message with friends, and express their identities with a various forms of message [22, 34]. Communication with a mobile instant messenger would lead users to experience emotional interaction with others.

Mobile instant messenger service enables users to easily engage in a long-distance communication [17, 34, 42]. Because a sender don't need to wait receivers' responses, they send out what they want to tell. After, then, receiving replies from their friends, they continue talking about it. It means that all users are ready to communicate with friends, who are registered in a mobile instant messenger service, at anytime and anywhere, so they might feel close even though they are physically far away. Kang and Jang [20] argue that the virtual space, to the extent of which users experience in a mobile instant messenger service, has become more concrete and richer, so the borderline between the real world and the virtual space would be blurred. Because, for example, communication participants feel like sharing their daily life through a mobile instant messenger, they would not make a clear distinction between the real and the virtual [20]. In addition, users could interact with friends and share information in real-time if they want. Lim [34] argued that the absence of a chatting room in a mobile instant messenger was interpreted as the cessation of the communication with others for users, and reported a user's testimony, "I felt connected with others by keeping chatting rooms opened, and it makes me perceived that my social relationship is sustained and I have conversation partners." Because people always carry their smartphone everywhere, a mobile communication has become a part of their daily life, and it intensively makes them feel that they are connected with friends emotionally [20, 34]. This characteristic could be one of reasons why people love to use a mobile instant messenger, and Lee et al. [31] named it as the interpersonal communication continuity.

Another characteristic of a mobile instant messenger service could be benevolence. In the context of business, benevolence refers to the ability to take care of consumers' interests ahead of its own self-interest and express sincere concern about it [7]. Dijike and Cremer [14] examined the impact of leaders' benevolence on procedural fairness and endorsement of prototypical leaders, and benevolence was defined as a leader's activity for supporting the group's interest. In general, benevolence can be defined as the quality of someone who involves an activity of kindness to support and help others. Under the context of communicating with others using a mobile instant messenger, benevolence would be a kind of motivation, rather than an activity or personality. If you want to talk someone who is far from you, the simple and easy way would be to give a phone call, but he/she might be too busy to receive. That is one of reason why some people prefer a mobile instant messenger to a phone call [31, 34]. Because senders do not know under what kind of situations receivers are, sending out messages through a mobile instant messenger would make receivers respond at any time they feel comfortable. Lee et al [31] suggested that this kind of benevolence would be one of emotional characteristics that users experienced when communicating with a mobile instant messenger. Benevolence in a mobile instant messenger would be highly related to media synchronicity. If receivers are under difficult situation for responding to incoming messages immediately, they could confirm messages and communicate with senders later. A mobile instant messenger enable users to experience this benevolence in the communication process [34, 38]. The title of your paper should be in bold face, all caps, single-spaced, and centered across the top of the first page.

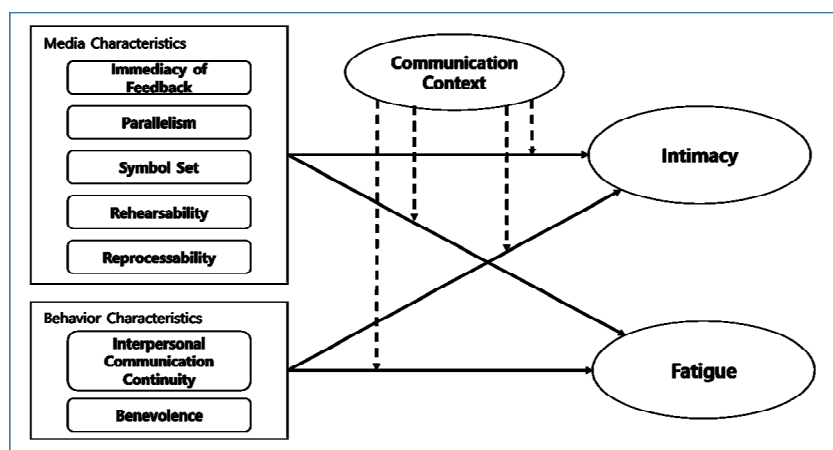
## Fatigue and Intimacy

Since ICT (Information and Communication Technology) became a part of our daily life, a variety of social issues related to ICT has been raised. Although, for example, smartphone has positive impact on information exchange, social relationship and communication [15, 19], there are the dark side of ICT such as stress caused from the overuse of ICT devices [46, 50]. Prior studies about digital fatigue argued that people would feel difficulty for using online services and complicated digital devices, and be tired of managing social network and communication [26, 32]. Checking out friends' postings and adding comments with a smartphone could disturb users' daily works [23], and the pressure for maintaining social relationship and the information overload would lead to digital fatigue [32]. Fatigue refers to mental or physical exhaustion, tiredness, and languidness [25]. Hart et al. [16] defined fatigue as a subjective evaluation about uncomfortableness, tiredness, and low motivation, and Piper et al. [45] proposed it as a subjective feeling about tiredness. Fatigue is one of the most common side effects when using a mobile communication [31]. In this study, we defined fatigue as a subjective evaluation about mental or physical pressure and exhaustion caused from using a mobile instant messenger.

Intimacy is an essential aspect in the interpersonal relationship [30] because people has motivation for interacting others and building up warm and close interpersonal relation. Interpersonal process model of intimacy explained intimacy as general perception which was generated from repeated interpersonal interaction over time and it was affected by self-disclosure, partner disclosure, and partner responsiveness [30, 47]. Communication mediated by internet has been used to manage or maintain the interpersonal relationship established in the offline [53], and recently people perceived internet as an alternative communication channel for building a new relationship [4]. People would easily devote themselves to a variety of interactions through internet-based communication and it results in increasing the interpersonal relationship and emotional intimacy [3, 41, 49, 52]. People would using online communication for confirming their identities through interaction, expressing their emotional status, sharing private part of their daily life, and forming connectedness and intimacy [40, 43, 44, 51]. Thus, intimacy can be interpreted as a positive outcome of interpersonal communication, while fatigue can be perceived as a negative outcome.

## HYPOTHESES

To identify which factors influence the communication with a mobile instant messenger, this study focused on media synchronicity theory and prior researches about the communication. Based on the literature review, we built up the research model for explaining how media and behavioral characteristics affect intimacy and fatigue. A mobile instant messenger such as KakaoTalk and WeChat has become one of the most important and frequently used apps in nowadays, so we figure it our based on media synchronicity theory, which proposed five dimensions (transmission velocity, parallelism, symbol variety, rehearsability, and reprocessability). To the end, we propose the research model and investigate how media and behavioral characteristics affect intimacy and fatigue (see Figure 1).



<Figure 1> Research Model

First of all, a mobile instant messenger has a wide range of transmission velocity. Transmission velocity is the speed of delivering a message to receivers, so messages would reach to receivers immediately if transmission velocity is high [12]. Also, high transmission velocity could allow receivers to respond incoming messages quickly. In general, a mobile instant message enable to deliver messages to intended receivers as soon as sending it out, but it is another story whether receivers read it immediately or not. If receivers are really busy or do not pay attention to their smartphone, they would check out messages later. It means that receivers can decide to read messages now or later even though a mobile instant messenger deliver it as soon as senders send it out. It is one of interesting characteristics of a mobile instant messenger, so we used immediacy of feedback, rather than transmission velocity, in this study. Interpersonal process model of intimacy [30] suggests that communication partners' feedback has a positive impact on the formation of intimacy. The qualitative research about a mobile instant messenger revealed that people felt uncomfortable for late response from receivers and interpreted receivers' fast responses as respect or care about

them [34]. On the other hand, Kim and Lee [26] found that frequent interactions and information exchange on SNS led to increasing digital fatigue because they felt pressure to respond others quickly. Cho et al [9] argued that communication overload would increase in a low synchronous media rather than a high synchronous media. Because a high synchronous media forces people to respond immediately to senders, their mental pressure would not be cumulated. If they use a low synchronous media, the number of unresponded messages might increase over time and as a result they would feel the mental pressure [9, 11, 28]. These lead to the following hypotheses.

H1: the immediacy of feedback in a mobile instant messenger is positively related to intimacy

H2: the immediacy of feedback in a mobile instant messenger is positively related to fatigue

Parallelism refers to the width of the medium, which means how many the concurrent messages effectively take place over [12]. If you want to send out messages to many people through the old media such as telephone, you should do it one by one, but the new media such as a mobile instant messenger enable them to do simultaneously. Because of the limited cognitive capacity and mental resource of human being, handling many task at the same time would result in cognitive overload, and it makes people feel fatigue [8]. For example, Kwak et al. [29] argued that performing other activities during chatting with friends on a mobile instant messengers would cause information overload and it makes people tired. On the other hand, the simultaneous communication with a variety of friends would enable users to get more chances for building up and keeping good relationship [31]. Compared to desktop PCs, smartphone is free from special limitation for connecting internet, so people are easily engaged in the communication at anytime and anywhere. A mobile instant messenger would be appropriate media for people who want to communicate others freely. Therefore, it leads to the following hypotheses.

H3: Parallelism in a mobile instant messenger is positively related to intimacy

H4: Parallelism in a mobile instant messenger is positively related to fatigue

Symbol sets is the height of the medium, which means a variety of ways to encode information for communication [12]. Because people use different types of symbols to deliver what they want to say in their communication process, it is essential and fundamental. People can communicate with a variety of ways such as a handshake, facial expression, moving the head, and a voice tone in a face-to-face conversation, but a text-based mobile communication (e.g., SMS and a mobile instant messenger service) is relatively limited. Information transmission and processing efficiency is affected by symbol sets. For example, text-based media such as email would relatively take more time to encode than a voice mail, while it might be reversed in decoding a message [12]. When communicating others with a mobile instant messenger, most information would deliver in the text format, so people have difficulty to express their emotion on the screen. Also, they want to deliver their subtle emotional nuance to communication partner, but the text is not good enough to do. Therefore, people in mobile instant messenger would use a variety of emoticons (or emoji) to express their emotion [27, 35]. However, they might be unsure whether their emotion clearly and exactly deliver through emoticons, so they tend to show their emotion more actively and exaggeratedly [1, 34]. This exaggerated expression would make people feel tired for using a mobile instant messenger. It leads to the following hypothesis.

H5: Symbol set in a mobile instant messenger is positively related to fatigue

After sending messages out through a mobile instant messenger, it is impossible to set back a clock before sending it out. Senders should be careful to write a message and examine it before press the button. Lee [34] conducted the depth interview which focused on college students' daily experience about using a mobile instant messenger, and found that they felt some pressure when they needed to write messages carefully. If the communication takes place through a mobile instant messenger, all messages would be kept until exiting and closing the chatting room, so these characteristics make people feel tired. Prior studies about SNS argued that SNS users felt pressure and fatigue for using SNS because of managing and maintaining human relationship on SNS [25, 39]. Nowadays many people actively use a mobile instant messenger for building, managing, enhancing, and expanding their human relationship. If, however, they write improper message and send it out, it could easily give some damage on their human relationship. Therefore, it leads to the following hypotheses.

H6: Rehearsability in a mobile instant messenger is positively related to fatigue

H7: Reprocessability in a mobile instant messenger is positively related to fatigue

A mobile instant messenger enables people to communicate others anywhere and anytime, so it will be helpful to maintain good relationship with their friends [17, 42]. When talking friends with a mobile instant messenger, they open a chatting room and invite them. After finishing talk, they usually keep opening the room, rather than closing it. A user testified that keeping chatting rooms opened in the mobile instant messenger would make her feel sharing her daily life with her friends through the mobile instant messenger [20]. This virtual space could enhance their intimacy with friends by emotional connection through the

mobile instant messenger. Lee et al [31] also argue that people might feel like communication continuing when they open the chatting room. On the other hand, one of reasons why people use a mobile instant messenger rather than a phone call is that they do not know the current situation a communication partner is facing. If they are busy and difficult to receive a phone call, a mobile instant messenger would be better way to communicate [34]. Because people take care of others' situation, they would contact their friends with a mobile instant messenger, not phone call. This benevolence would give positive impact on their human relationship. Therefore, it leads to the following hypotheses.

H8: Interpersonal communication continuity in a mobile instant messenger is positively related to intimacy

H9: Benevolence in a mobile instant messenger is positively related to intimacy

Nowadays a mobile instant messenger is widely used for personal and business, so the impacts of media and behavioral characteristics would vary depending upon whether it is used for personal or for business. For example, the immediacy of feedback would be more critical to people who use it for business than those who do for personal. Symbol set would be less important in the business communication than in the personal communication. Rehearsability and reprocessability would have more impact in the business communication. Also, interpersonal communication continuity and benevolence would be meaningful when people use a mobile instant messenger for personal, rather than for business. Also, Dennis and Valaich [13] suggest that communication consists of two processes, conveyance (transmission of information) and convergence (mutual agreement for understanding). The performance of media would vary depending on the media synchronicity, and the communication context (business vs. personal) would give different weight on conveyance and convergence processes. Thus, it leads to the following hypothesis.

H10: The communication context moderates the effects of media synchronicity and behavioral characteristics on the intimacy

H11: The communication context moderates the effects of media synchronicity and behavioral characteristics on the fatigue

### CONCLUSION

In sum, this study aims to demonstrate why people prefer using a mobile instant messenger to giving a phone call based on the media synchronicity theory and other researches. Since the diffusion of smartphone changed our daily life, the interest about a mobile instant messenger dramatically increases. Many prior researches about a mobile instant messenger were based on Technology Acceptance Model (TAM) or Theory of Planned Behavior (TPB), which used typical variables such as perceived usefulness, perceived ease of use, intention to use, and etc. These researches was meaningful when the target product was in the early stage, but because the market of a mobile instant messenger was in the mature stage, we would like to focus on the communication itself, rather than the intention to use a mobile instant messenger. Specifically five characteristics of the media synchronicity and two behavioral characteristics are expected to affect intimacy and fatigue when using a mobile instant messenger, and the degree of the impact of these factors are expected to vary depending on the communication context (personal vs. business). Based on the theoretical background and our prediction, it would be expected to provide the useful insight about a mobile instant messenger.

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