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Social Media Usage and Self-Esteem: The Moderating Role of Media Literacy, Comparison Tendency, and User Motivation

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SOCIAL MEDIA USAGE AND SELF-ESTEEM: THE MODERATING ROLE OF MEDIA LITERACY, COMPARISON TENDENCY, AND USER MOTIVATION

by

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ABSTRACT

Studies on Facebook and Twitter have shown that social media usage negatively influences individuals' self-esteem. Many scholars believe media literacy could help reduce this negative impact. Social comparison tendencies and user motivations may also influence this dynamic. The current study is designed to test the moderation effects of media literacy, comparison tendency, and user motivation influencing WeChat Moments usage on individuals' self-esteem. A group of Chinese college students (N= 299) participated in an online survey. Results show no negative association between WeChat Moments usage and self-esteem. Media literacy only negatively moderates this effect among those who reported having 20-50 friends. The tendency to compare opinion and ability and the tendency to make downward comparisons do not show any moderation effect. The upward comparison tendency negatively moderates the positive association between the number of posts per week and self-esteem. Lastly, if people's motivations for using WeChat Moments are to make connections, expose themselves, and make social influences, there are no moderation effects. However, when people's motivation is to seek information, it negatively moderates the association between the number of friends and self-esteem. Cultural background and platform characteristics are discussed, and the findings might help future studies.

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DEDICATION

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IRB	Institutional Review Board
USM	The University of Southern Mississippi

CHAPTER I - INTRODUCTION

New technologies are boosting at a fast pace today (McNeil, 2002), especially in mass communication (Loubere, 2021). Mass communication technologies accelerate society's development (Meso et al., 2006; Loubere, 2021). From this perspective, creating and sharing information could boost the development of society because of the distribution of useful information to the right people. Thus, the eagerness for social development provides an opportunity for mass communication technologies. Affordability and accessibility lowered the cost of obtaining information. The result is that the development of communication technologies was constantly making progress.

Hardware-wise, new communication technologies using modern technologies give ordinary people more opportunities to access the latest technologies at an affordable price. The performance of smartphones nowadays is also impressive. Today’s smartphones can do what older computers could but at a more affordable price and convenient fashion. More and more people can have their own devices because of the lower prices. That means more information is created, used, and stored, and exchanging information would benefit society.

Smartphones are not just an upgrade to the traditional cellphone. It became an instant communication tool, a personal digital center, and a portable terminal that can help exchange nearly the same amount of information as a laptop or personal computer. With the development of the smartphone industry, a smartphone can replace a laptop or older desktop if the productivity level does not require too much calculating power. From the personal computer to the new smartphone, technologies make communication tools smaller and more portable. People nowadays can always have smaller but faster personal

digital assistance with them. Upgraded accessibility and productivity release the limits to more people and allow them to fetch or store more information faster and more unprecedentedly.

Software-wise, technology development is also staying at a fast pace. According to the official report from the US government, there were only 25,800 computer and information scientists and 530,730 computer programmers in the US in 2000 (US Bureau of Labor Statistics, 2002). Whereas 18 years later, there are 1,666,270 software developers and programmers and 4,214,820 computer-related jobs (US Bureau of Labor Statistics, 2019). That develops better applications that can be used in various fields. In 2020, there were around 8.9 million mobile applications specifically designed for smartphone usage, according to Koetsier (2021) from Forbes.com. Because these applications include nearly many aspects of human society, it changes social norms and personal identities.

New communication technologies have helped people develop society but also build new social norms and personal identities. New technology introduces new habits and socializing forms (Trepte et al., 2021). The virtual online world was a way to obtain existing knowledge, brainstorm with people worldwide, and gather information and content for other people using linked devices. Unlike previously, people have a separate real identity and a virtual identity. However, nowadays, virtual identity is part of a person’s real identity (Williams et al., 2006). New technologies changed social norms online, created new habits, and changed real-life cultures because of the development of new communication technologies. Consequently, portable smartphones changed people's way of living and formed new customs and cultures.

New customs and cultures are formed due to the fast development of small and portable terminals, forcing human society into a smartphone age. The information and content provided are more suitable for smartphones to fit the requirement of social development. These changes make the whole society link everything into a digital network. The concept is The Internet of Things (Ali et al., 2015). If everything connects everything via the Internet, people can control everything and connect with others through the Internet (Suresh et al., 2014). People can use their smartphones to control and communicate with both people and devices. This makes the smartphone unique for people to connect to the internet because of its portability and easier accessibility. Thus, when many people have smartphones and start communicating with people and devices, smartphones have become the center of human society today. The portability and availability formed new rules and cultures. Unlike the traditional laptop or desktop age, the impact of the smartphone age comes from the new ways of communication, bringing new psychological challenges to human society.

New standards and cultures are created based on the fact that society relies on smart devices. People can socialize with more people worldwide. Different voices can be heard, and different online niche subcultures have become more acceptable for mainstream culture. The exchange of information brings mutual understanding for people with different backgrounds. Affordability connects more people to the internet. More participants generate more information exchanges, gradually forming a new social standard that suits the smartphone society. New definitions of politeness, civility, and way of expression are formed under this background. Interestingly, Martínez-Alemán and Wartman (2008) observed this phenomenon and addressed how online culture and

identities influence real life. The result is that online norms and cultures change traditional human norms and even generate new psychological processes to handle the changes.

With or without the Internet, people constantly compare themselves to others to re-evaluate themselves (Festinger, 1954). However, after having the ability to connect to the Internet, their comparison reference has never been this wide. It is easy for a person to see other people's successes and failures in the smartphone age because digital contents are easily accessible. Previously, primarily celebrities and opinion leaders dominated the traditional mainstream media. In contrast, in daily life, colleagues, classmates, and even family relatives are the primary comparison reference for people to locate their egos and re-evaluate themselves. Social media platforms allow ordinary people to publish their own opinions and stories. Unlike in the traditional media age, the number and the range of comparison targets increase sharply in the social media age. Everyone has a platform to exhibit their own lives and stories in the social media age. That makes the reference target closer and more vivid than comparing themselves to celebrities because celebrities usually have a psychological distance from the lives of ordinary people (Carpentier & Hannot, 2009). Carpentier and Hannot (2019) address that the power of "common heroes" has a stronger impact than celebrities when people make social comparisons. Their rationale emphasizes that ordinariness is powerful when combining the shining moments on social media. As a result, comparing these ordinary people on social media to themselves impacts more than comparing themselves to celebrities. People think these virtual comparison targets are real, just like people they know in person in real life.

Secondly, online identity is now part of one's real identity because online activities are considered real daily activities for real life. People do not have a virtual identity and a real-life identity anymore. However, the virtual identity is part of the real-life identity. Today, people can see others from a much bigger range because social media provide platforms for everyone to share their stories and even create their own brands. That attracts many people to cherish this chance to share their lives on social media because it was previously a privilege for celebrities. The culture of exhibiting one's own stories becomes a fashion and stylish as many people join to post their own content on social media. That makes the online identity real on some social media platforms. In other words, the posts are part of their lives.

Based on new mixed identities of individuals online, new online culture is formed, and it influences people's self-esteem because the new online culture creates more chances for people to compare their personal information with other comparison targets on bigger exhibiting platforms online (Labrecque et al., 2011). Self-esteem is not only a personality trait but also a result of comparing and evaluating others. The new social media creates a new virtual self-image (Supple & Plunkett, 2011). Creating content is related to building personalized online images. After seeing other people's lives, people would re-evaluate his/her own self-esteem. This process happens everywhere in human society nowadays because people will always carry a smartphone with them, checking and seeking information all the time. Plus, a large amount of content and information is available online, and the speed of spreading information has never been this fast. Thus, it changes all the mechanisms of individuals making social comparisons

in today's human society. The good news is that people can get information faster than ever. The bad news is that information can get to people faster than ever.

This upgraded information structure is a global phenomenon but more obvious in countries quickly adapting digital communication technologies. Since the technology boosts from the early 1990s, China has developed dramatically in digital communication technologies, especially those based on smartphone technology. The China Internet Network Information Center (2022) believes that China has become a smartphone society because the rate of smartphone access to the Internet rate is higher than 99%. When smartphones were a must-have for any society, the social norm and culture started to change. People use smartphones to replace their wallets, keys, or even governmental-issued IDs. It can be explained from two perspectives. Hardware-wise, more affordable smartphones were available in Chinese languages. Software-wise, many applications specially designed for Chinese smartphone users were created. The necessity and popularity of using smartphones in daily life lead to a speed-up in information penetration because of their easy accessibility and portability. Society can enjoy the speed of information exchange, which will boost the development of the whole society. The side effect of information is also accelerated, and it might harm those who are not ready to suit the pace of modern communication technology.

Smartphone technologies build a new social comparison reality and environment in China. Making social comparisons are universal for human beings to re-evaluate themselves. This helps people better understand the living environment and the world. Making different types of social comparisons could be a reason to moderate the association between social media usage and self-esteem (Wang et al., 2007). Social

comparison theory indicates that making upward and downward comparisons could cause positive and negative effects. The upward comparison would cause anxiety, lowering one's self-esteem when re-evaluating oneself. However, it also might increase one's self-esteem when one uses upward comparison as a motivational stimulus. In comparison, downward comparison can cause higher self-esteem because it makes people feel better about themselves. However, making too many downward comparisons could also cause lower self-esteem because people start assimilating themselves and think as the downward comparison targets. Furthermore, Gilbert et al. (1995) believe that making social comparisons is the basic practice of building a self-concept. Thus, it is universal from time to time. Gibbons and Buunk (1999) argue that the difference among individuals is the tendency to make social comparisons. They believe that the ability and opinion comparison are the actual practices for people to make evaluations, improvements, and enhancements during the process of making social comparisons.

Likewise, Burrow and Rainone (2017) argue that different motivations to use social media moderate the association between social media and self-esteem. The logic is that those strongly socially motivated individuals could be affected more than those who are not socially motivated when using social media. The *Uses and Gratification Theory* explains the reasons individuals use different media to fulfill their psychological needs (Ruggiero, 2000). Although the *Uses and Gratification Theory* evolved from the early 1940s, its core is still suggesting people have different motivations for choosing media. Specifically, Dhir et al. (2017) argue that there are six main categories for using the Internet: Information seeking, connection, exposure, social influence, coordination, and

entertainment. Different purposes and motivation levels would moderate the impact of media usage on its psychological impact (Przybylski et al., 2013).

Using social media affects individual users' self-esteem (Valkenburg et al., 2021). Scholars find that media content can harm people in different areas (Jeong et al., 2012; Ozimek & Bierhoff, 2020). Since the early days of the development of communication technologies, there has been a dark side to every product of communication technologies. The problem is that the information spread contains misinformation inside, eventually leading to the readers misinterpreting some information. Plus, overwhelming information can damage people psychologically without proper digesting ability. Media usage influences people's decisions, worldviews, and how they see themselves (Varkaris & Neuhofer, 2017). Jan et al. (2017) argue that heavy media usage correlates with lower self-esteem, which shows a negative correlation between media usage and self-esteem. That means the more a person uses social media, the lower his self-esteem will be, and vice versa. On the contrary, Valkenburg et al. (2021) argue that social media usage has a small but positive association with self-esteem. Nevertheless, using media is useful for individuals to obtain information, so it is inevitable to ignore the influence of media usage because it can help society to boost. How to avoid the unwanted influence of using media is an essential topic for people to handle and digest overwhelming information correctly.

Media literacy intervention is a concept that believes media literacy education would help people to reduce the harm or unwanted influence of the consumption of media usage (Jeong et al., 2012). Paxton et al. (2022) consider media literacy is a filter that would protect a person from being harmed by using media content. Buckingham

(1993) believes that media literacy is a learnable ability: once people understand, they will read information differently. The concept is trying to build a buffer filter to protect people by reducing the negative side effect of media. In other words, media literacy is a moderating factor as a coefficient in affecting media usage on self-esteem (Kleemans & Eggink, 2016; Xiao et al., 2021). Stein and Prewett (2009) believe that a person with high media literacy ability would get less harm from the harmful impact of media usage on self-esteem. On the contrary, a person with low media literacy would get a more negative impact. The influence of media literacy is still arguable in academia due to the sampling size and the limited number of existing studies.

So far, most studies are based on western social media platforms and testing this topic with different variables. Cingel et al. (2021) reviewed the current studies regarding this topic and suggested: "the true relationship between social media use and self-esteem is person-specific and based on individual susceptibilities and uses (p. 1)". Their review shows that there are multiple variables that could influence the dynamic association.

Thus, this study examines the moderation effect of different media literacy levels, comparison tendencies levels, and motivation types in influencing the relationship between social media use and self-reported self-esteem in a Chinese setting. Does social media usage associate with self-esteem even in a different culture and environment other than Western society? It is questionable to understand media literacy as a set of armor or a protective shield. Once a person is equipped, he/she will benefit from it for life. Does media literacy work in terms of moderating the influence? Would media literacy work in a collective culture background? Do comparison tendencies and different types of media usage motivations have any moderation effect on self-esteem? To answer these questions

above, this study designed an online survey to examine WeChat Moments usage and self-reported self-esteem to comprehend the moderation effect of media literacy, comparison tendencies, and motivation types.

CHAPTER II – LITERATURE REVIEW

Social Media: Definition and Construction

From computer-based social networks (Wellman, 1996) to the virtual community (Romm et al., 1997) to the later social network service (Marwick, 2005), to social networking sites (O'Murchu et al., 2007), to today's social media (Kaplan & Haenlein, 2010), the academia had used different terms to emphasize the different aspects of social media in different times but describing the same concept: an online place that people can socialize.

Kaplan and Haenlein (2010) believed that the Usenet was the original prototype of a modern social medium for individuals to post information to the public by Truscott and Ellis. Others thought the *Open Diary*, founded by Bruce and Susan Abelson, was the rudiment of the weblog and then eventually transited into today's Blog (Sajithra & Patil, 2013). Later, social networking sites gradually started to get into people's daily lives. The virtual world concept emerged. That indicates that the online world is the second world coexisting with people's real lives (Ridings et al., 2002). The new technology improved the *World Wide Web* and *User Generated Content* Web 2.0 (Sajithra & Patil, 2013). This Web 2.0 referred to more than a technological upgrade for the websites. It emphasized the UGC concept was the kernel of today's social media. In other words, people were able to produce, receive and distribute content to other people (Howard & Parks, 2012). Thus, social media were the vehicles that carried the information.

Carr and Hayes (2015) define social media as "Internet-based channels that allow users to opportunistically interact and selectively self-present, either in real-time or asynchronously, with both broad and narrow audiences who derive value from user-

generated content and the perception of interaction with others (p. 50)." They summarized multiple scholars' social media definitions and concluded that social media should have the following characteristics: Internet-based, disentrained and persistent channels, perceived interactivity, user-generated value, and Masspersonal communication (Carr & Haye, 2015).

Aichner et al. (2021) emphasize the change in social media's definition during the last twenty-five years. Their systematic literature review researches the change of social media definition from 88 papers filtered out of 38750 search results on EBSCOhost. Their research concludes several patterns containing the definition of social media. First, after 2002, more and more researchers believe social media is not a "virtual" world but a part of our present world. Second, as a medium, shareable, or exchangeable user-created content is the key for a social platform to be a medium instead of a social communication tool. Third, around 2018, social media was not considered only a laptop or computer-based application. It can be on a mobile smartphone or pad.

After summarizing the advantages and disadvantages from the existing definitions, most scholars agree with the definition of social media need to have these characteristics: 1. Connect people to engage in social communications; 2. Via different types of devices; and 3. Allow user-generated content to be shared and created.

Therefore, this paper defines a social medium is a communication tool that connects people together to engage in communicating via different devices and can allow users to publish their content to the public.

Social Media in China

From the early Bulletin Board System (BBS) to the later online forums and chat rooms, online socialization in China started in the early 1990s. CFido, a Chinese Bulletin Board System, was created online by a hobbyist named Luo Yi, according to Wu (2019). This attracted many Chinese Internet pioneers. The emailing system in the Chinese language was first created by Netease, one of the giant tech companies in the world. Following the success of Netease, a group of Internet pioneers launched their own enterprises. Alibaba, Tencent, Baidu, and Sina were the survivors of the primitive period of the Chinese online industry.

As a result, social media in China are relatively different compared to traditional media in China. Traditional media were usually owned and controlled by the state. However, Fuchs (2015) pointed out that the ownerships of the major social media companies, "Alibaba, Baidu, Sina, and Tencent – are all privately owned capitalist corporations listed on stock markets. They are predominantly listed on US stock markets (Alibaba: NYSE, Hong Kong Stock Exchange; Baidu: NASDAQ, Sina: NASDAQ, Weibo: NASDAQ, Tencent: Hong Kong Stock Exchange (p. 14)".

QICQ, originally a Chinese language instant messenger software based on an instant messaging software named ICQ, was created by Tencent. American Online bought ICQ and filed a lawsuit against Tencent in 2001. Tencent changed the name from OICQ to QQ. From then on, QQ became one of the essential tools for Chinese society (Negro et al., 2022). QQ, in a sense, was the beginning of Chinese socializing online. It taught the Chinese netizens about the wonderfulness of the Internet. Later, Tencent

developed this Qzone, which was a similar version of MySpace and influenced millions of people to create their own online space and build their own online identities.

Blog was first introduced in China by blogchina.com and later became bokee.com in 2002. Bokee wasn't a very successful example, but its idea inspired multiple other companies to join. Sina used famous influencers to create content. Many celebrities saw the chance and joined to use social media to communicate with fans. Although there were many other competitors, such as TianYa blog, or NetEase Blog, Sina was probably the most influential blog in China.

FanFou MicroBlog was created by later Renren.com in 2007. It was a mini version of the Blog, similar to today's Twitter. Jigu, Tencent, and many other similar MicroBlogs coexisted during that period. In 2009 Sina started its own version of MicroBlog named Weibo, which was the largest MicroBlog that still survived in China today. Unlike other MicroBlogs, Weibo was famous for allowing official accounts for companies or governments. It has become a significant social media for Chinese society.

The dramatic growth of Chinese social media attracted academia's attention. Unlike the trending topics on Twitter or other social media is majorly from the news, the trending topics on Chinese social media usually depend on retweeting media content (Yu et al., 2011). Even though social media in China do have a deleting content step (Bamman et al., 2012), after analyzing 40 million activities, Gao et al. (2012) argue that contents on Chinese social media are majorly people's personal activities. This makes Chinese social media closer to normal people's real lives than Twitter or Facebook. Similarly, Facebook or Twitter might have more users, but most Chinese social media platforms only use one language. This is a significant advance in terms of the spreading

of information. In a way, the accumulation of normal people's activity on Chinese social media changed the whole society by improving the way of living (Peng, 2019), business style (Chen & Fu, 2016; Ge & Gretzel, 2017; Xu et al., 2019), the culture (Shao & Wang, 2017), and even the worldview (Greis et al., 2015). That's why many scholars study Chinese social media in different areas.

Then, the development of mobile technologies changes everything. People in China rely more on smartphones. That makes Weibo an additional application, but not a must-have application like the instant messenger application like WeChat. The trend of academia started to shift their focus from Weibo in the previous decade to the recent WeChat Moments. More and more studies show that whichever platforms are easier to access would have more influence. As a result, many studies have shifted their attention from Weibo to WeChat Moments, a personal online space style social media inside WeChat, because WeChat and WeChat Moments can do more things than just posting a tweet or sharing some content and suit better for social and psychological studies (Montag et al., 2019).

WeChat Influences Modern China

WeChat is a cross-platform smartphone application developed by Tencent, a Chinese multinational technological, entertainment, and multimedia cooperation. WeChat was originally designed as a smartphone application that suits the smartphone's age better (Wang et al., 2008). It is an instant communicating messenger that can send text, photos, and videos. It is designed to take over the dramatically increasing mobile social service market. Although WeChat wasn't very successful in the global market, WeChat still suits

the era in China and is deeply rooted in the Chinese people's daily activity (Wang et al., 2008) beyond only being a social media communication tool.

The mobile industry has developed dramatically in China (Li, 2020), which provides the soil for WeChat to dominate after the failure of other Chinese social platforms, such as Renren (Jia, 2022). Good signal connectivity and lower smartphone prices help the rise of WeChat. After all, it is an application that relies on an Internet connection and a smartphone to connect everything to its own open-source platform center. As a result, WeChat quickly took over the market of Chinese social media and became the most dominant social communication tool for Chinese people (Chen et al., 2019). Tencent's annual report claims that WeChat has more than 1.2 billion monthly active users by the year 2020 (Tencent Holding Limited, 2021). That means nearly every Chinese person has a WeChat account. Not only do WeChat's communication functions dominate Chinese social activity, but also its other functions change the traditional way of Chinese living standard.

WeChat Pay is one of the most important functions that actually changed Chinese society into a digital currency-friendly society (Qu, 2015). People use WeChat to scan QR codes to replace the previous function of a credit card or a traditional wallet. People can pay on their smartphones via mini-programs that WeChat developed for the business end. Also, they can pay small businesses or individuals by scanning QR codes to make a direct transaction. WeChat Pay is a checkout terminal for people to order daily tickets and purchase things. People can purchase train or subway tickets by showing their Payment QR Code or scanning the other's payment QR code. According to the same report Tencent Holding Limited published in 2021, WeChat generates 1.6 trillion RMB

total transactions annually. That makes WeChat becomes more than just socializing medium but a dominant must-have tool for modern China and people who speak Chinese.

Furthermore, WeChat is a valid way to carry official authorized digital identification. For example, previously, a government-issued id was in a hard copy of an ID card or a piece of paper to demonstrate its usage. Nevertheless, after digitalizing this information, people can now just open WeChat and show their ID, increasing convenience and decreasing the possibility of losing the paperwork. The most important aspect that a digital ID can bring is instantly changing the status of a person's ID. Lei (2020) addresses that the Chinese government requires citizens to have a mandatory health code to travel or visit other indoor places during the Covid-19 pandemic. The health code can tell if a person has been exposed to other infected people by using location data and cellphone signal data. These functions are just a few important functions that WeChat changed Chinese society. As a result, reversely, WeChat nowadays is the center of one person's daily life because it contains nearly every digital information that a person needs. WeChat, *per se*, is beyond a common social media software but a center platform for everything in life.

Montag et al. (2018) reviewed current studies based on WeChat and WeChat Moments. They summarize that there are three major aspects of existing studies: motivational, welling-being, and societal aspects. Motivational studies about WeChat usually care about the reason for certain people's behaviors. Studies concentrating on well-being usually focus on the influence and psychological impact of social media usage. They observe more studies from the social aspect than from the individual aspect and find more studies tend to look at the groups and influences for society instead of the

individual's psychological impact (Montag et al., 2018). Montag et al. (2018) argue that "[a]lthough WeChat has become an integral part of everyday life for many users, research has only recently begun to examine the impact of this development on the societal and individual levels" (p.9). In other words, academia has started to look for deeper reasons to explain the consequences of using WeChat and WeChat Moments, so that they can better understand how human and human society works.

The Uniqueness of WeChat Moments

WeChat Moments is a social platform allowing people to produce, receive, share content, and interact with others on WeChat (Chen et al., 2019). It includes many common social media functions: sharing or creating long and short videos, text, comments, and likes. WeChat Moments has the same function as other social media in terms of interactivity and dynamics. Also, WeChat Moments allows enterprises and organizations to create their own official account so that people can subscribe to get their information updated. Additionally, WeChat Moments can generate QR codes for any account for easier access by scanning a QR Code. Therefore, WeChat Moments has slightly more functions than other social media because it integrates more applications from other businesses or officials. People in China like this one-stop-for-everything tool (Chen et al., 2018).

WeChat Moments has its own uniqueness that other social media do not have. Primarily, because WeChat doesn't provide a function that allows people to search for strangers easily, the friend system and circle structure are mostly based on people's real-life friends or, at most, some second-tier connections. The influence of this decision is that friends on WeChat Moments are not just in a virtual world because most people they

know from WeChat Moments are relatively real. It is more like an extension of people's real lives. Second, because WeChat has a mature payment system, so the viewers can reward and tip the content while watching other people's creations. This boosts the development of content creation. Hosts can get rewards directly from live streaming, and content creators can request paid content. In this sense, WeChat Moments is beyond a traditional virtual world content-sharing social medium but a social media platform for a person's real life. Most importantly, WeChat Moments is mostly based on a smartphone system. The content created for it is more suitable for the content to be viewed on a smartphone than other social media platforms based on a desktop or laptop computer.

The environment of WeChat usage in China is unique. International competitors such as Facebook or Instagram are blocked in China (Li, 2020), and local Chinese competitors are not big enough to compete with WeChat and WeChat Moments (Qu et al., 2015). That objective situation makes WeChat Moments becomes the dominant platform for most Chinese people. As the dominant communicating tool, many people in China depend on WeChat as a basic necessity for daily life. The result is that WeChat Moments is one of the most commonly dominated social media in China (Wang et al., 2008; Wu, 2014), mainly because it is a default inclusion in WeChat.

Furthermore, many newbie internet users access the Internet through smartphones in China. As a result, when Tencent published WeChat Moments as a default part of WeChat, WeChat Moments became many people's first social media. This is because the number of Chinese internet users accessing the Internet directly via smartphone grew dramatically within a few years (China Internet Network Information Center, 2022). Especially for older people in China, from 2010 to 2020, using smartphones to connect to

the Internet became an essential requirement for living in modern China, according to the report from China Internet Network Information Center (2022). Many of the newbies have started to learn to use WeChat. That means WeChat Moments was the first available social medium for them. This unique situation provides WeChat Moments have a more significant level of influence for newbie users compared with other social media applications.

The demographic distribution of WeChat's major monthly active users is interesting. Unlike many other social media that the younger generation was dominating, WeChat's age distribution is relatively equal. Facebook has only around 10% of its users who are over 45 years old worldwide, whereas WeChat has nearly 19% of its users who are over 41 years old (CNNIC, 2022). That means WeChat is not purely a young people's toy. The older generation uses it as a living necessity. Because of the distinctive age distribution, WeChat basically builds up a very large market for its social media. WeChat Moments taught many of these older generations who had no previous experience with social media to use social media. As the first social medium for many smartphone users, learning and comparing themselves with others is a new lesson for many newbies.

WeChat Moments Usage and Its Measurements

Although the social media definition is mostly agreed upon in academia, how to define a person's usage is not universally agreed upon. Scholars have their own understandings of how to measure and what to measure in terms of a person's social media usage according to their own understanding of social media usage. Different scholars usually emphasize different aspects to measure different social media.

From the early days, scholars tried to measure the usage of social media. Rosen et al. (2013) use the time spent on social media to represent engagement. The logic is based on feasibility because time is measurable, and longer time means deeper involvement. As quantitative-based data, time is relatively easier to collect. However, if the amount of time was equal, then actively publishing information and causally reading other people's content is not at the same engagement level. In a way, time can represent many things but can not explain everything. Other scholars tried to measure the frequency a person uses social media (Jenkins-Guarnieri et al., 2013). Measuring frequency can reflex social media engagement to an extent. The more frequently a person checks his/her social media, the more attention he/she spends. Nevertheless, this only represents the level of engagement to a certain degree, too. Checking social media frequently sometimes does not mean one has committed. It probably only represents a behavioral pattern, even probably an unconscious behavior or habit. In other words, the overuse of social media can cause a problematic social media usage phenomenon that could be explained by the addiction theory. Furthermore, other characteristics have been measured from different aspects to represent social media usage: the total length of using a particular social media platform (Kang, 2010) and the number of friends on a particular social platform (Ozimek & Bierhoff, 2020) have been attempted.

The *Uses and Gratification Theory* indicates that user habit does not equal emotional devotion because people may have different reasons to use different social media platforms (Li, 2005). Thus, two aspects are measured to indicate the level of social media usage of a person: the habitual side of usage and the emotional devotion to describe how social media influence a person. Emotional connection is being measured

via different tools. Specific social platform intensity is being measured to test the emotional connection and the influence of social media on a person (Roberts & David, 2020; Trunfio & Rossi, 2021).

To measure social media usage, many scholars have developed their own self-report scales to quantify the level of social media usage. The advantage of this self-report scale is obvious: a relatively easier way to accomplish, a quicker way to determine its statistical meaning, and a more accurate way to reflex the characteristics of this mass behavior. It is a valid method for gathering data in academia.

Similar to other social media, many scholars use questionnaires to collect self-report behavioral data when they are measuring WeChat Moments usage. The questionnaire usually contains several parts. The data generally contain the basic information of the users because it is probably the easiest part to fill out in a questionnaire. Age, gender, and educational background are the most common questions. Sometimes, race, ethnicity, religion, socioeconomic status, sexuality, marriage status, occupations, and family income are collected to fill out special usage in different studies. To measure social media usage behavioral habits, the length of using a particular social medium, the number of friends on that social medium, and the hours spent per day using that social medium would not be uncommon. These questions would reflect users' habits of using one particular social medium.

To measure the usage of WeChat Moments, Wang et al. (2018) have tested a scale that is a revised version of the Facebook Intensity Scale with other modified questions. Ellison et al. (2007) created the Facebook Intensity Scale. The modified scale is a revised 6-item 1-5 Likert scale to measure the emotional connection relying on WeChat

Moments. Wang et al. (2018) add that "The use of WeChat Moments is a part of my everyday activity (p. 33)." Wang's statement tests the willingness of a person to socialize through WeChat Moments. Then questions are to test emotional connection with WeChat Moments. Other than the basic background information, the following variables are also measured: the total length of use history, friends numbers, daily time spent, updating frequency, and average Likes received per post (Wang et al., 2018). This scale has been tested in the real field and shows the individual's behavior habits or patterns. It can represent the users' WeChat Moments usage.

As Montag et al. (2018) advocated, later studies found many significant psychological impacts of using WeChat and WeChat Moments. On the positive side, WeChat and WeChat Moments can provide information, entertainment, and relax people (Xu et al., 2016). However, when it goes to a certain degree, WeChat is very easy for people to get addicted to (Li et al., 2018). Elhai et al. (2020) argue that the fear of being missed out is one of the core mediators that smartphone usage causes anxiety and depression studying WeChat. Hou et al. (2017) studied the excessive usage of WeChat, and they believe locus of control is a possible reason. That result is similar to the point of view of the study by Zhou and Wang (2018).

Anxiety and depression are other colossal side effects of using WeChat and WeChat Moments. Li et al. (2018) argue that the deep reason for the anxiety caused by using WeChat Moments is from comparing with other people's perfect posts. In other words, it is a fear-like feeling during the self-evaluation process when making a comparison with other people (Li, 2019). Wang et al. (2018) address the eagerness for "Likes" on WeChat Moments use would hurt a person's self-esteem because it is a social

acceptance eagerness. In short, all these scholars are saying one thing: making a comparison with other people from society.

Self-Esteem: Constructs and Operational Definition

According to Rosenberg (1965) 's understanding, self-esteem is a psychological idea that people assess their own to adjust their value and merit. From this point of view, self-esteem contains two folds: acknowledging and valuing oneself. Coopersmith (1967) emphasizes the worthiness of oneself evaluating himself. Many scholars have expressed their own understandings of this concept. Branden (1994) pointed out that the benefit of high self-esteem, which is one feels better about themselves, could improve one's confidence and thus increase the chances of dealing with troubles. On the other hand, Tennen and Affleck (1993) argue that low self-esteem is a trait that one would think negatively about themselves, and this low self-esteem would cause a troubling feeling that would influence one to feel negative about oneself and the surroundings.

Brown, Dutton, and Cook (2001) proposed a new perspective to looking at that definition by checking the context self-esteem is used. They point out three distinctive aspects of using self-esteem: the pure feeling about oneself, the evaluating process about oneself, and the temporary emotional being in one particular moment. These contribute to aspects of the self-esteem construct.

In other words, modern scholars do not think that self-esteem is not only an internal psychological process but also an emotional response to oneself, according to Wang and Ollendick (2001), and how people handle this feeling (Greenwald & Banaji, 1995). This angle emphasizes the emotional reaction afterward. It is not only a mentally subjective feeling but a psychological process to re-evaluate one person by oneself.

Abdel-Khalek (2016) defines self-esteem "as the self-evaluation and descriptive conceptualization that individuals make and maintain with regard to themselves (p. 3)." This definition not only addresses the reactive response towards self-evaluation but also provides a deeper route to how individuals deal with that feeling or evaluation. That means self-esteem contains three parts: the feeling, *per se*., the reflexive part of self-evaluation, and how a person handles this in one's mind. Therefore, self-esteem is defined as a psychologically responsive reflection of how a person values oneself and his ability and how he/she handles this emotional being in this study.

Measuring self-esteem has a long history. In the early days, Rosenberg (1967) designed a scale to measure one's self-esteem. His questionnaire is still widely used in many of today's studies. Rosenberg (1967) proposed a way to measure self-esteem by measuring three aspects: self-worthiness, self-competence, and self-acceptance. This self-report measurement has ten items five-point Likert scale to measure self-esteem. Participants will choose a number from one to four to describe what is the most accurate match for them. This measurement scale has been tested in different cultural settings, such as in Asian (Wang et al., 2018), Arabic (Afari et al., 2012), and American countries (Rusticus et al., 2004; Supple & Plunkett, 2011), and so on. Its validity and reliability have both been tested in different fields across different cultures. This scale can reflect the level of self-esteem level.

Social Comparison Theory: Opinion, Ability, Upward, and Downward Comparisons

American social psychologist Dr. Leon Festinger developed a psychological explanation theory to explain why people compare themselves to other people. It is a foundation for exploring how people would make an evaluation about themselves and

adjust their psychological feelings with other information (Festinger, 1954). Frestinger (1994) argues that there is a mechanism inside a human that will make them compare themselves to other people so that they can re-evaluate their own egos. There are two major types of comparisons and two types of comparison orientations.

Festinger (1954) argued that ability and opinion comparison would influence a person's behaviors. Jones and Regan (1974) believe the evaluative need is an extremely important psychological process. Opinion comparison is basically comparing an individual's capability, whereas opinion comparison is comparing other people's opinions. Dakin and Arrowood (1981) analyzed the ability comparison, and they believe the most typical three forms of ability comparisons are competition, cooperation, and conformity. Suls et al. (2000) addressed three main types of opinion comparison: preference assessment, belief assessment, and preference prediction.

Vogel et al. (2014) believe that upward social comparison is people comparing with someone better than themselves, whereas downward social comparison means comparing with someone inferior, or at least not as good as themselves. People have a tendency to make comparisons between themselves and others as references during the social comparison process (Krizan & Bushman, 2011). Scholars believe there is a tendency for some people to view themselves more positively and brightly after comparing themselves to upward conditions (Collins, 2000; Johnson & Stapel, 2007). This is because this type of upwards comparison is usually made when these people think of themselves as a part of the higher socioeconomic group than the others at the bottom (Johnson & Stapel, 2007). Johnson and Stapel (2007) believe the afterward threat feeling

inspired people. Van de Ven (2017) argues that envy or admiration feeling is the reason to improve their performance. Thus, it is a self-enhancing process.

When the upward comparison generates a discrepancy, they sometimes would no longer feel good at all but a feeling of inferiority. Schmuck et al. (2019) found that people feel worse when using upward comparison, especially using social media, and it hurts individuals' self-esteem. Liu et al. (2017) believe personal traits, such as optimism, play an important role in moderating negative feelings. Similarly, Robinson et al. (2019) explain this as making an inappropriate reference as a comparison target.

The downward comparison is also a double-edged sword. When comparing themselves to others in a more inferior position, people tend to have a better feeling about themselves. People are sometimes unaware that they are using this strategy to adjust themselves (Gibbons et al., 1991). Occasionally, professionals suggest people use this with patients to make them feel more positive about themselves (Affleck et al., 1987). Nonetheless, the dark side of the downward comparison is also significant. When a person constantly makes downward comparisons but no upward comparisons, his ego is going to swell. He will generate an unrealistic and over-inflated self-assessment, and that would also lead to a look-down or even discriminating feeling (White et al., 2006).

Social comparison happens all the time, especially on social media. Social media allows people to meet new people, gather information, brainstorm, and eventually use new data to develop society, but it still has significant side effects. Becker et al. (2013) found a significant increase in depression symptoms among the group using social media, as well as a significant increase in social anxiety. Reinecke et al. (2017) address the stress that social media causes would lead to psychological health problems. Similar studies can

be found in many other countries and cultures across the planet (Padhy et al., 2014; Judd, 2018; Malaeb et al., 2021).

These psychological effects can be explained by understanding the change in self-esteem change while using social media. When people enjoy new information and content from other people, they also make a comparison with other people to evaluate their current lives. Park and Yang (2017) believed lower self-esteem would cause depression and anxiety in the long term. Therefore, low self-esteem and depression are strongly related (Sowislo & Orth, 2013). Other studies have shown a similar connection between self-esteem and psychological well-being, such as depression/anxiety (Manna et al., 2016; Duru et al., 2019; Nguyen et al., 2019). In other words, solving the self-esteem change could be a solution that solves many social media usage psychological challenges.

The negative symptoms of using social media can be explained by using the social comparison theory. This theory believes that people usually assess themselves by making comparisons with others to adjust their ego and self-value (Festinger, 1954). Upward comparison is to compare a person that is better, and it would cause either damage or inspiration. Downward comparison is comparing oneself to another person who is in a lower position, and it could either improve one's self-image or generate contempt feeling toward other people.

A person's self-esteem level deeply influences the result. Aspinwall and Taylor (1993) emphasize that people with high self-esteem would benefit from the upward comparison. In contrast, low self-esteem should make a more downward social comparison to make them feel better (Wills, 1991). People should consider using different strategies to adjust their psychological feelings based on their self-esteem levels.

Heatherton and Wyland (2003) emphasize the linkage of "self-esteem and depression, shyness, loneliness, and alienation" (p. 219), which means self-esteem is associated with socialization. Although socializing online is different compared to socializing in person, a recent study shows that a highly active socializing online person would also have a higher tendency to socialize offline (Jiang, 2018). Therefore, socializing via social media can be considered a way of socializing.

However, online activities on social media also have unpleasant effects. Shakya and Christakis (2017) did an extensive survey using the data of 5,208 participants from three surveys over three consecutive years across the United States and found a negative association between Facebook activities and self-reported well-being by measuring Facebook/offline activities as well as self-reported physical health, self-reported mental health, self-reported life satisfaction, and body mass index. Hawi and Samaha (2017) also find that social media addiction and low self-esteem are associated. This is because people tend to make an upward comparison during using socializing on social media. Jan et al. (2017) surveyed 150 students regarding whether their Facebook uses influence self-esteem and claimed that “[i]ncrease in social media usage causes the self-esteem of individuals to decrease (p. 329).”

Unlike many studies that show negative associations between social media usage and self-esteem, some studies show different results when they do not use Facebook or Twitter as the social media platform to study. Wang et al. (2018) apply this connection to Chinese WeChat Moments and find two variables WeChat Moments use intensity and likes received positively associated with self-esteem, whereas the frequency of status updates is negatively related to self-esteem. Their study suggests there is something in the

middle to influence the dynamic association. Wang et al. (2018) explain this fundamental argument using personal power and social acceptance as mediators and demographic moderators. Similarly, Xu et al. (2016) surveyed 1979 Chinese college students. They found a positive association between WeChat users and their self-reported sleeping quality. They explain this phenomenon as a result of releasing daily depression by using WeChat to get better sleep. In other words, WeChat and WeChat Moments could have something unique to reduce harm. That is one of the significant reasons this study focuses on WeChat Moments instead of Facebook or Twitter.

As social comparison theory suggested, upward comparison may cause a discrepancy during the socializing process if a wrong reference is set (Wills, 1991). On social media, the posts from others are usually the best moments or beautiful pictures of one's life. They would stimulate the other people's instinct to start to make a comparison and adjust their self-evaluation.

Gibbons and Buunk (1999) designed a scale to measure social comparison tendencies by checking both the opinion and ability comparison tendencies. O'Brien et al. (2009), Brown et al. (2007), and Vogel et al. (2014) all utilize similar questions to measure the tendency of making upward and downward comparisons by directly asking the participants about their attitude to making upward/downward comparisons. The comparison types and targets would influence the association between social media usage and self-esteem. Various types of motivation for using different media may also influence the dynamic process.

The Uses and Gratification Theory and Its Measurement

The *Uses and Gratification Theory* has been applied in numerous communication research, including explorations into countless implications of social media. This theory dates back to the 1940s. This theory focuses on audiences consuming media for different purposes. It explains the rationale for why they select and prefer certain media to fulfill their needs. Joinson (2008) used factor analysis and identified seven uniqueness for Facebook: "social connection, shared identities, content, social investigation, social network surfing, and status updating (p. 1027)." Whiting and Williams (2013) argue ten uses and gratifications are for using general social media: "social interaction, information seeking, pass time, entertainment, relaxation, communicatory utility, convenience utility, expression of opinion, information sharing, and surveillance/knowledge about others by interviewing people to discuss the deeper reasons (p. 362)." Gerlich et al. (2015) research mobile consumers by using factor analysis and reveal five main motivations: "engagement/disengagement, pass time, knowledge and education, and social (p. 69)." Dhir et al. (2017) summarized a six-factor structure for Internet users: "information seeking, exposure, connection, coordination, entertainment, and social influence (p. 411)." In this case, entertainment can be included in the exposure and information-seeking categories. Previous studies have recognized the five most common primary factors: information seeking, exposure, connection, coordination, and social impact.

To measure the different use and gratification, although there were many other scales, most of the scales were either at least a decade ago or only designed for adults. The adolescent scale by Dhir et al.'s (2007) uses 27 questions to investigate the six aspects of the different motivations for using the Internet in general. This scale suits

college students and also suits testing the various types of motivations for using social media. An adapted Chinese version of the scale is designed to measure five aspects of different motivations in terms of using WeChat Moments: information seeking, exposure, connection, coordination, and social influence.

Media Literacy Moderates the Negative Effect: Construct and Measurements

In hopes of challenging the negative influence of social media usage, scholars and educators started to train people to raise their media awareness to fight back as an intervention against the negative connection on purpose. The rationale is based on McGuire's (1961) inoculation theory, which emphasizes that planting a seed of rationale or way of thinking can help to reduce future influence. Scholars have tested this idea in different fields, including body satisfaction (Mathews, 2016), smoking (Primack et al., 2006), violence (Paik & Comstock, 1994), racial awareness (Yosso, 2002), advertising (Buijzen & Mens, 2007), and general worldview (Stepanyan, 2019), to name just a few.

Media literacy is a relatively new term but not a new concept. Similar media literacy concepts can be traced back to the 90s, but different scholars have been using other terms to describe a very similar idea, which is equal to today's media literacy concept. They have used terms like digital competency, critical thinking ability (Feuerstein, 1999), critical reading (Hobbs & Frost, 20033), media analyzing ability (Sharma et al., 2020), information interpretation (Perald et al., 2007), digital literacy (Leaning, 2019), media awareness (Benesch, 2009), skepticism (Vraga & Tully, 2021), and to name just a few. Analyzing these keywords makes it not hard to find that these terms describe a phenomenon from two angles: skill and knowledge.

The term media literacy has been developed during the last decades (Aufderheide, 2018) and gained popularity after 2010. Koltay (2011) thinks that the word, media, initially referred to all existing media types, for instance, movies, TV, newspapers, radio, billboards, and so on. Literacy refers to a person's critical thinking ability to think critically about the information he/she received (Potter, 2013). The original idea of media literacy is to describe a type of ability that would help a person critically interpret and digest the information from the mass media (Arke, 2012). Media-literate people should have the ability to locate the information he/she needs, analyze the information, take out the biased part, and weigh the information that he/she received. This ideal model tries to explain the ability that people should have to understand how media mechanism functions and how to match the information correctly to get to fulfill personal needs (Carlsson, 2019).

Meyrowitz (1998) thinks media literacy contains three aspects: content, grammar, and medium literacy. According to this point of view, content means the ability to identify the actual content and comprehend its hidden value or meaning of the content. Grammar refers to the ability to identify the technical skills for media production. Medium literacy means the ability to use the extra knowledge base to digest different media characteristics and related background information. These three folds become the basic constructs of today's media literacy.

Learning and training can achieve high media literacy levels (Vraga et al., 2009). That means media literacy is a learned ability instead of an innate ability. An individual is capable of collecting, analyzing, and interpreting the information media sent out if an individual is equipped with this skill set and well-trained in terms of how to use them. It

is a learned process. It could be a self-training result or participating in a related training program (Comer et al., 2008). Once an individual gets that mental mechanism, they can understand and overcome the misinformation he/she received. This type of skill training program could help a person avoid unconsciously learning and repeating behaviors from the influence of media. Austin and Johnson (1997) trained kids to reduce the impact of bad media influence. That provides a vivid example for educators to advocate that media literacy would protect people from the overwhelming information abuse from the mass media. However, a specific knowledge base is required to build a protective shield if there is no specific training program (Livingstone et al., 2005).

Nevertheless, the core concept of media literacy is a kind of mental awareness and a knowledge base that would help a person always challenge the information they get from the mass media or their surroundings. Once the information is received, a person would use his/her media literacy to help them check the information, take the unwanted part of the information out, and only absorb the part that would benefit. In a way, it is a mental mechanism that could shield and protect a person from massive misinformation from mass media. Silverblatt et al. (2014) explain this as a requirement for a form of critical thinking skill that a person can collect, analyze, and interpret information without being influenced by the media or the sender of the information. For example, when a person with a high media literacy level, he/she could analyze the information first, critically evaluate the background and purpose of that piece of the information, interpret the information, and most importantly, create and access information for what he/she needs.

Media literacy has been used to successfully reduce the negative feeling of self-esteem caused by media usage has a long history. Media invention programs have been used to train kids to resist the negative influence of smoking (Banerjee & Greene, 2007) and violence (Scharrer, 2006) by correctly reading the media messages. Body satisfaction (Tamplin et al., 2018) and eating disorders (McLean et al., 2017) also use media literacy education programs to train people to overcome media influence. Even though the training programs are usually small and limited to a certain topic, the result shows that they can counter the negative impact. Similar successful studies can be found in alcohol intervention (Austin & Johnson, 1997) and sex education (Pinkleton et al., 2008), too.

New media literacy is basically putting traditional media literacy in a setting of new media. The logic is similar to the traditional media literacy construct. When a person has higher media literacy, he/she will have the ability to filter out certain useless information. Nevertheless, given the fact that new media is more dynamic than conventional media, new media literacy usually contains more than interacting with information from only one end.

Koc and Barut (2016) developed a set of questionnaires to test the level of media literacy, and their questionnaire contains four sessions to measure new media literacy: "functional consumption, critical consumption, functional presumption, and critical presumption (p. 834)." This measurement contains 35 questions in the questionnaire using a 1-5 Likert scale. 1 = *strongly disagree* to 5 = *strongly agree*. The questionnaire is designed smartly to cover the fundamental root of media literacy constructions.

The original questionnaire is long and repetitive, and some of the questions can be combined together for this study. A modified questionnaire is used to save time and

increase accuracy. The modified questionnaire combined similar questions from the original questionnaire. The original questionnaire is designed to test a person's different abilities in different categories. This study aims to test a person's overall level of media literacy instead of testing separate skills. As a result, this study uses a questionnaire with 11 modified questions

The Influence of Demographic Factors

Definitely, there are other elements that influence how media literacy moderates the negative influence on self-esteem from using social media. In terms of adjusting the consequences, gender is a crucial factor. Females have a higher significance in increasing low self-esteem, while males, on the contrary, are not very significant in terms of the result of media literacy intervention (Tamplin et al., 2018).

Age, although many of the studies in this field are young children or young adults, scholars believe age is still an important element that would affect the result (Jeong et al., 2012). Basically, age can reflex a person's learning time. It probably will not show the level, but it still reflects the time and sometimes efforts of learning and understanding the world. Personality will become mature only through aging. Thus, age is not the cause but the effect in this case, but it is an important factor that influences a person's self-esteem score.

Educational background and personal income are both important parts of a person's socioeconomic status. Bleidorn et al. (2016) did a cross-culture study by collecting a large sample (N= 985,937) and addressed that socioeconomic status associated with cultural value and background influences a person's self-esteem. The mechanism that pinpoints this argument is that educational background and personal

income would reflect a person's ability to accomplish a certain level of social achievement, causing an increase in their own understanding of how society and the world work (Twenge & Campbell, 2002). Once a person follows the value of society, society gives back to reward them. That is why socioeconomic status influences the self-esteem score.

Cultural values and background also significantly influence a person's self-esteem score (Bleidorn et al., 2016). Being humble is seen as a virtue in a collective culture (Oc et al., 2015). Therefore, a lower score on self-reported self-esteem will be shown (Heine et al., 1999). That does not mean the self-reported self-esteem score is universally negative in collective cultures (Cai et al., 2009). Being humble can protect a person from being harmed in the long term because humility reduces jealousy from other people and could also provide better social harmony for society (Kitayama et al., 1995). Another reason for a significantly lower score on self-reported self-esteem score is a lower boundary for pride and ego has been defined in a collective culture (Chakrabarti, 1992). In other words, score-wise, a person from a collective culture usually has a lower score than a person who grows up in an individualist culture. Applying these ideas to the Chinese settings would be an interesting idea to test if these elements are influencers.

This leads to many interesting questions about the current research flaws. Is a negative association between social media usage and self-esteem universal? Why do some studies show different results? Are there any particular moderators that can help reduce this negative association?

Current Research Problems

When people found that media would have a harmful effect on its audiences, some voices advocated that media literacy was a saver that could rescue people from the negative influence of mass media (Jeong et al., 2012). In another way, teaching media literacy to people is believed as a solution to reducing the harm of psychological impact (such as lower self-esteem) by using media. Media literacy intervention is a phrase that describes an educational program designed to help people to limit the negative impacts of media (Jeong et al., 2012). Its core is that once people are properly trained, they can use that set of skills to not only select and accept certain information but also digest and read the same information and create their own interpretations (Kellner & Share, 2005). Paxton et al. (2022) believe that media literacy is a buffer that protects people from harmful feelings.

The foundation of this problem is the presumption that there is a link between media use and undesired psychological effect so that media literacy intervention can save people from it. However, some studies demonstrate a healthy relationship between social media use and well-being, although they majorly come from a Chinese setting. Why these studies showed different results? Why don't their studies show a strong negative association like the others? Does culture play a role here? Do media characteristics play a role here? Then, a deeper discussion regarding the media literacy intervention can be discussed. Does it work? Does that work in a collective cultural background? Do other elements influence this moderating process?

CHAPTER III - HYPOTHESIS

H1: Higher Levels of WeChat Moments Usage Will Lead to Lower Self-Esteem

Based on previous literature, higher social media usage will negatively correlate with lower self-esteem. There are multiple arguments about this, but many scholars believe that this can be explained as the upward comparisons that a person makes consciously or unconsciously. Although many similar social media usage and self-esteem studies showed a negative association, some found no connection, and very few found a positive association. Testing whether the negative correlation exists is the first step in testing the moderators.

H2: Media literacy Moderates the Effects of WeChat Moments Usage on Self-esteem: Higher Degrees of Media Literacy Will Help Reduce the Negative Impact on Self-Esteem

Media literacy level will decide how a person understands and interprets the information. As a result, it will buffer the negative influence. Multiple studies argue that certain increasing media literacy education in a specific program has shown the sign of being a moderator. Nevertheless, nearly all of them focus on one or two aspects, such as violent content media literacy training, alcohol awareness, female body media literacy training, and so on. Although the media literacy level will decide how a person understands and interprets the information, ideally, it should buffer the negative influence of using social media. Nevertheless, there are doubts in academia questioning this buffer effect.

H3: Social Comparison Moderates the Effects of WeChat Moments Usage on Self-Esteem

Four variables are being tested to check this: comparison tendency, comparison preference, WeChat Moments usage, and self-esteem. The logic pinpoints this is that if a person has a higher tendency to make social comparisons, then he/she could care more about other people, which in this case, could harm his/her ego by making comparisons. Reversely, if a person does not like to make social comparisons, he/she will compare less, and according to previous studies, he/she should face less impact on his/her self-esteem. Similarly, scholars argue that the target they prefer to make social comparisons with could be a reason for the negative connection between low self-esteem and high social media use. But this is questionable because the data from the existing studies are not persuasive. In other words, these two factors could influence the significance of the impact as a moderator effect.

H4: User Motivations Moderate the Effects of WeChat Moments Usage on Self-Esteem: Socially Motivated Usage Will Lead to a Stronger Negative Impact

According to the *Uses and Gratification Theory*, different motivation for using media leads to different attitudes toward the media and the content. For example, suppose a person's purpose is to use social media to gain influence; when he makes comparisons, his own ego probably will be harmed more than those people whose goal is to entertain himself/herself. A few studies have shown that different purposes of using social media moderate negative feelings. Most of those are not thinking of it from a media studies point of view. They believe different purposes are fixed personality traits from a psychological or sociological point of view.

CHAPTER IV – METHOD

Participants and Procedures

Participants were recruited from the *Shandong University of Finance and Economics*, Shandong Province, China, via in-classes announcements by two local recruiters. Participants were paid 10 Chinese Yuan after completing the online questionnaire. IRB approval in Chinese was shown before the beginning of the survey, and online consent was required before participating in this survey. All questions in the questionnaire were presented in Chinese after a reverse translation check confirmed by two Chinese Ph.D. students currently studying in US universities. Other than the categorical questions, participants rate on a 5-point Likert scale. From 1 (*strongly disagree*) to 5 (*strongly agree*).

The online survey received 430 responses. A total of 299 valid questionnaires are obtained (N=299). Male participants comprised 43.8% (N = 131) of the sample, and females were 56.2% (N = 168) (See Figure 1). One hundred sixty-six students (55.5%) were from news, journalism, or communication-related majors, 133 students (44.5%) were from other non-communication majors (See Figure 2). 21 freshman students (7.0%), 158 sophomore students (52.8%), 73 junior students (24.4%), 28 senior students (9.4%), 11 graduate students (3.7%), and 8 participants (2.7%) reported as other in the class standing category participated this survey (See Figure 3) by using an online survey tool, Tencent Questionnaire through WeChat app link. (https://wj.qq.com/s2/10898108/859c/).

Self-reported family annual income in Chinese Yuan was asked by choosing from five different categories to shorten response time. Thirty-one participants were from a family earning less than 20,000 Chinese Yuan per year (10.4%), 56 participants reported

a family income ranging from 20,000 to 50,000 Chinese Yuan per year (18.7%), 82 participants were from a family that had an annual income between 50,000 to 100,000 Chinese Yuan per year (27.4%), 108 participants were from a family income between 100,000 to 300,000 Chinese Yuan per year, and 22 participants were from the family whose family annual incomes were higher than 300,000 Chinese Yuan per year (7.4%) (See Figure 4).

Figure 1: Descriptive Data of Major

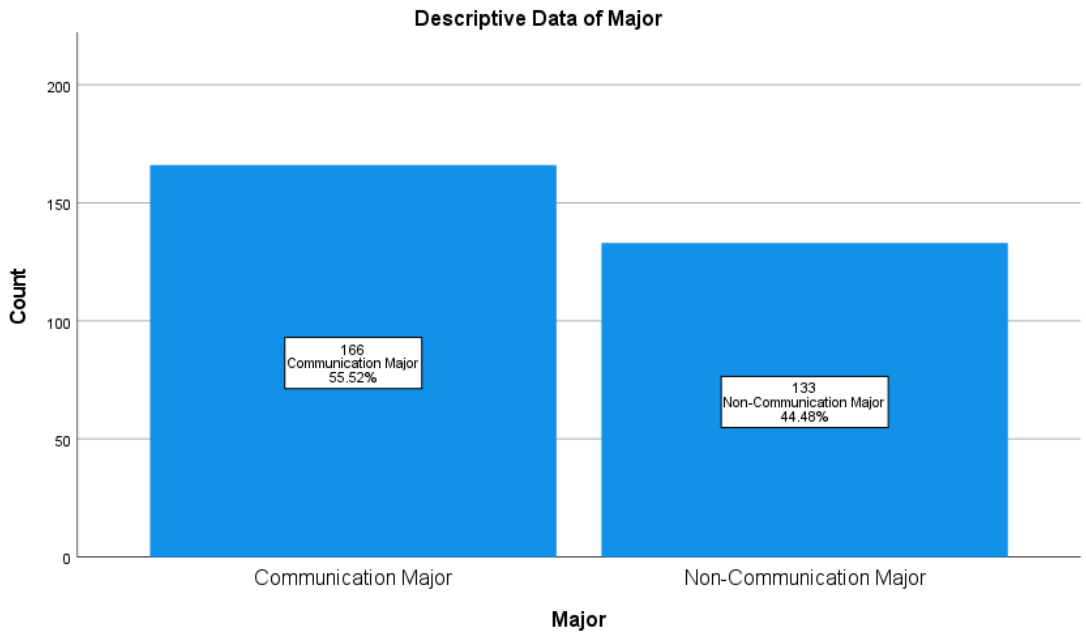


Figure 2: Descriptive Data on Gender

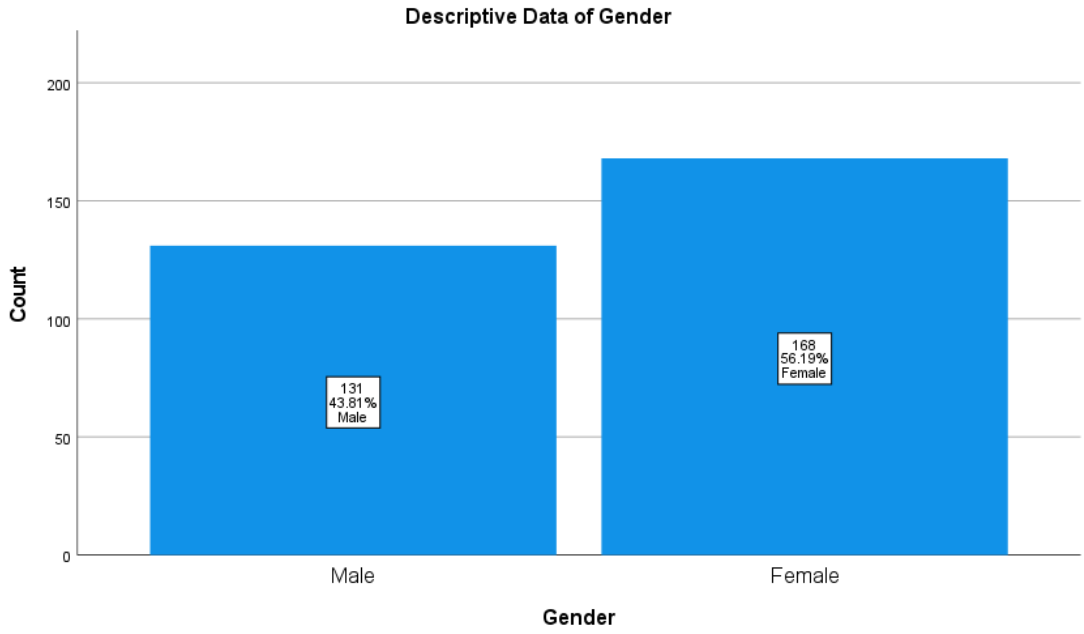


Figure 3: Descriptive Data of Family Annual Income

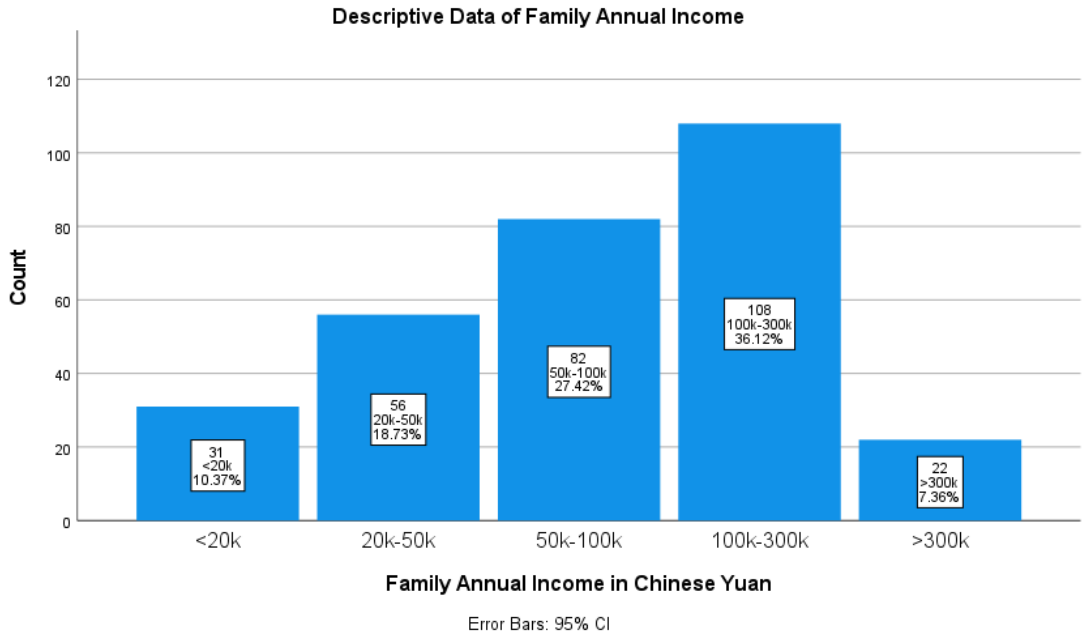
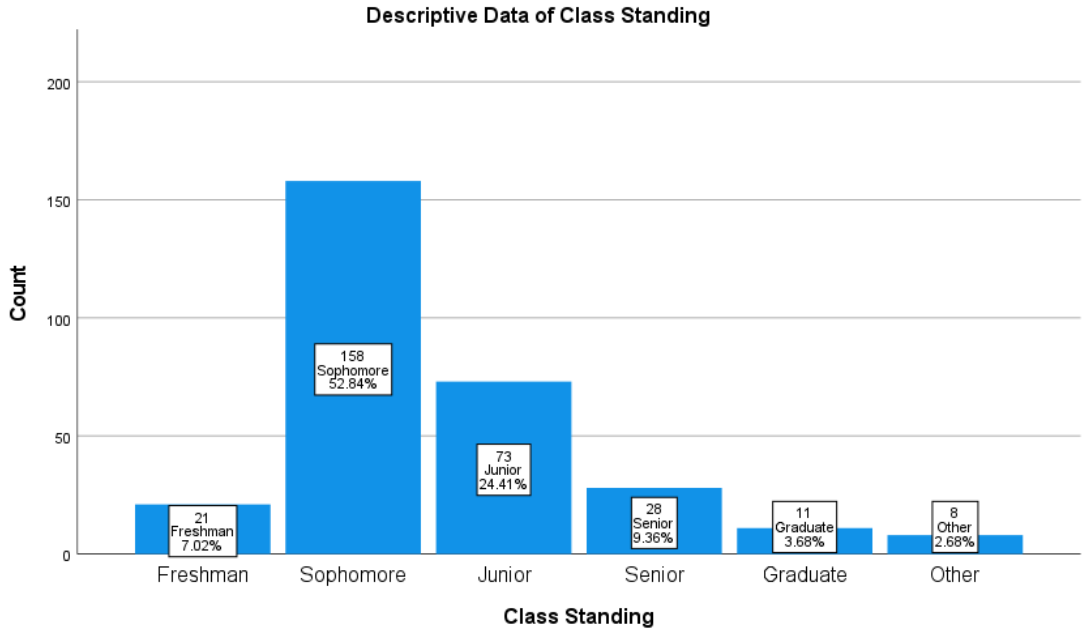


Figure 4: Descriptive Data of Class Standing



Measurements

The demographical part of the questionnaire included four questions. Question 1 focused on school majors: communication-related majors or non-communication-related majors. Question 2 asked about gender. Question 3 surveyed participants' family annual income in Chinese Yuan by choosing from five different categories: 1. <20k; 2. 20k-50k; 3.50k-100k; 4. 100k-300k. 5. >300k. Lastly, Question 4 concentrated on the class standings: 1. freshman; 2. sophomore. 3. junior; 4. senior; 5. graduate; 6. other.

Self-esteem (Y) is a belief in one's self-acceptance (Branden, 1971). To measure this, Rosenberg's Self-Esteem Scale (1965) was used to measure this from three aspects: self-worthiness (Questions 5 to 7); the sense of competence (Questions 8, 9, 13, and 14); and self-acceptance (Questions 10 to 12). Questions Q5, Q6, Q8, Q10, and Q11 of this scale had a normal score, which means choosing strongly disagree gets a point of zero

and strongly gets a point of 4. Questions Q7, Q9, Q12, Q13, and Q14 in this scale had a reversed score-calculating system. That means choosing strongly disagree would get a score of 4, but strongly agree would have a zero. The final score ranged from zero to forty points. A higher score meant higher self-esteem. Many studies have used it in multiple countries and cultures with many different languages to measure one's self-esteem, including both the positive and negative sides of the feelings. Cronbach's alpha was 0.823 for this scale.

Media literacy (W1) is the capability to use media information and assets to access, create, share content, and critically analyze the message. Therefore, Koc and Barut (2016) believe four aspects can be used to link the concept to the measurement: (1) functional consumption is the ability to acquire and comprehend media content's literal meaning. (2) critical consumption is the capacity to evaluate and digest media content from social, cultural, economic, and political perspectives. (3) functional prosumption is the ability to engage in and produce new media content. (4) critical prosumption is the ability to send out his/her own beliefs and discuss with others people regarding their ideas. A revised scale from Koc and Barut's study in 2016. Questions 15 to 19 are for functional consumption. Questions 20-24 are for critical consumption. Questions 25 to 27 are for functional prosumption. And Questions 28 to 33 are for critical prosumption. Choosing strongly disagree would get one point, and strongly agree will have five points. The final score sums up all 19 questions, and it ranged from 19 to 95. Cronbach's alpha was 0.920 for this scale. The result showed the lowest score was 46, and the mean was 71.90, with a standard deviation of 10.759. See Table 1 below.

Table 1. Descriptive Statistics of Final Media Literacy Score

	N	Range	Minimum	Maximum	Mean	Std. Deviation	Variance
To_Med	299	49	46	95	71.90	10.759	115.755
Valid N (listwise)	299						

WeChat Moments Usage is measured from two aspects: the emotional connection with WeChat Moments (X1) was a revised scale from Facebook Intensity Scale, and basic using habits (X2 to X6) such as time, frequency, and so on. A revised version of Wang et al.'s (2018) scale is used to measure these two aspects. Question 34 to 39 is designed to measure the intensity part with a sum of all six questions. Scores ranged from 4 to 24. Higher scores mean a person had stronger feelings or deeper connections about using WeChat Moments. Cronbach's alpha was 0.938.

Questions 40 to 44 measured the behavioral characteristics of using WeChat Moments by providing categorical choices to shorten the responding time. Q40 was to measure the total length spent on WeChat Moments (X2): 1. less than a month; 2. 1-6 months; 3. 6 months -2 years; 4. 2 - 5 years; 5. more than 5 years. Q41 asked numbers of friends (X3): 1. less than 50; 2. 50-200; 3. 200-500; 4. 500-1000; 5. more than 1000. Q42 was designed to measure the daily hours spent using WeChat Moments (X4) :1. less than 1 hour; 2. 1-2 hours; 3. 2-4 hours; 4. 4-8 hours; 5. more than 8 hours. Q43 focused on posts per week shared on WeChat Moments (X5): 1. less than 2 posts; 2.2-5 posts;3. 5-10 posts;4. 10-20 posts; 5. more than 20 posts. Q44 investigated the participants to gauge the

average number of likes they got on every post (X6): 1. less than 5 likes; 2. 5-10 likes; 3. 10-20 likes; 4. 20-50 likes; 5. more than 50 likes

The motivation for using social media measurement was based on the Internet Use and Gratification Scale, developed by Dhir et al. (2017) to measure the different types of usage of the Internet from six different aspects: the desire to seek information, expose to gather information about educational, career, and job information and opportunities; connect with others; events coordination; entertainment; and make social influences. To measure these, a revised scale is used. It is based on Dhir et al.'s (2017) research. Questions 45 and 46 are to measure information seeking (W6), Questions 47 to 49 are for connection (W7), Questions 50 to 53 are for exposure (W8), Questions 54 to 55 are for social influence (W9), and the rests are for coordination (W10). Scores were added up for every session. A higher score meant a higher tendency toward certain motivational categories. Cronbach's alpha was 0.904.

Upward comparison/downward comparison: upward comparison is comparisons with other people in a better position, whereas downward comparison means comparing people in a worse condition. Questions 59 to 60 were the upward comparison (W3) and downward comparison (W4) scale on using social media. They were adopted from the *Upward Physical Appearance Comparison Scale* (O'Brien et al., 2009), *Upward Comparison at Work Scale* (Brown et al., 2007), and *Facebook Upward Comparison Scale* (Vogel et al., 2014). These two questions' scores ranged from one to five points on each question. A higher score meant a higher tendency to make certain types of comparisons. Because there were only two questions in this part, so Cronbach's alpha was only at the acceptable level, 0.503.

Social comparison tendency categorizes the behaviors of different types of people who would make social comparisons. Scholars believe this tendency includes two parts: comparisons of abilities and comparisons of opinions. Thus, measuring these two parts can reflex the tendency to make social comparisons. Gibbons and Buunk (1999) designed an 11 items scale to measure this tendency. The first six items measure the comparisons of abilities, and the others measure the latter. This paper revised the scale by combining similar questions together. Questions 60 to 62 were designed to measure abilities. Question 63 and Question 64 were to measure the tendency of comparing opinions (W2). Scores ranged from 1 to 5 for each question. The tendency of ability comparison was the sum of Questions 60 to 62, whereas the tendency of opinion comparison was the sum of the last two questions (W3). Cronbach's alpha was 0.790.

Table 2 below shows a clearer vision of the relationship between the variables and the measurement on the final questionnaire. Variables are coded with predictors as X, the outcome as Y, and moderators as W to test further dynamics and interactivity in STATA and SPSS.

Table 2. Variables Dictionary

Variables	Questions
Demographics	1-4
Self-esteem (Y)	5-14
Media Literacy (W1)	15-33
WeChat Moments Usage Intensity (X1)	34-39
The total length of WeChat Moments Usage (X2)	40
Number of Friends on WeChat Moments (X3)	41
Daily hours spent using WeChat Moments (X4)	42
Times of Posting/Sharing on WeChat Moments Per Week (X5)	43
Number of Likes Received Per Post on WeChat Moments (X6)	44
Motivation: Information Seeking (W6)	45-46
Motivation: Connection (W7)	47-49
Motivation: Exposure (W8)	50-53

Table 2 Continued.

Motivation: Social Influence (W9)	54-55
Motivation: Coordination (W10)	56-57
The Tendency of Making Upward Comparison (W4)	58
The Tendency of Making Upward Comparison (W5)	59
Opinion Comparison Tendency (W2)	60-62
Ability Comparison Tendency (W3)	63-64

CHAPTER V – RESULT

Overview of the Descriptive Data

The frequencies of categorical predictor variables (X2 to X5) are listed in Table 4. Because the participants are college students, therefore, for the total length of usage, no participant has chosen longer using WeChat Moments for more than 5 years. Most participants use WeChat Moments for longer than 6 months, have 50 to 500 friends, spend less than two hours per day, and post less than 5 times per week. Interestingly, the number of likes they received per post varies, ranging from less than 5 likes per post to more than 50 likes per post.

Table 3. Frequencies of Predictors (X2 to X5)

Total Length (X2)	Number	Percentage
less than a month	27	9.0%
1-6 months	72	24.1%
6 months -2 years;	137	45.8%
2 - 5 years	63	21.1%

Number of Friends (X3)	Number	Percentage
less than 50	27	9.0%
50-200	159	53.2%
200-500	90	30.1%
500-1000	19	6.4%
more than 1000	4	1.3%

Table 3 Continued.

Daily Hours Spent (X4)	Number	Percentage
less than 1 hour	190	63.5%
1-2 hours	78	26.1%
2-4 hours	21	7.0%
4-8 hours	9	3.0%
more than 8 hours	1	0.3%

Posts Per Week (X5)	Number	Percentage
less than 2 posts	212	70.9%
2-5 posts	70	23.4%
5-10 posts	11	3.7%
10-20 posts	5	1.7%
more than 20 posts	1	0.3%

Likes Per Post (X6)	Number	Percentage
less than 5 likes	29	9.7%
5-10 likes	45	15.1%
10-20 likes	86	28.8%
20-50 likes	112	37.5%
more than 50 likes	27	9.0%

Correlation Hypotheses Test

Based on previous literature, higher social media usage will be negatively related to lower self-esteem (Jan et al., 2017). Six regressions are used to test the association between WeChat Moments Usage (Xs) and Self-esteem (Y). WeChat Moments Usage is measured through six different categories: WeChat Moments Usage Intensity (X1), Total length of WeChat Moments Usage (X2), Number of Friends on WeChat Moments (X3), Daily hours spent on using WeChat Moments (X4), Times of Posting/Sharing on WeChat Moments Per Week (X5), and Number of Likes Received Per Post on WeChat Moments (X6). (From X1 to X6). By using the model below, checking the predictor variables from X1 to X6 and the outcome variable Y can test the relationship:

Model 1: $Y_{Self-Esteem} = aX_{Social\ Media\ Usage}$

Hypothesis Test

Six regressions are made to test whether there is a relationship between WeChat Moments usage and self-esteem. This way can show whether there are any correlations between the predictors (Xs) and the outcome (Y). To be more specific, because many of the variables are categorical, every category has been tested separately in this case. See the result in Table 5. Results show that H1 was rejected. WeChat Moments Usage Intensity (X1) does not show any significant impact on Self-Esteem (Y). The coefficient is only 0.0886, with a standard deviation of 1.66.

Furthermore, the predictors from X2 to X6, which are Total length of WeChat Moments Usage (X2), Number of Friends on WeChat Moments (X3), Daily hours spent on using WeChat Moments (X4), Times of Posting/Sharing on WeChat Moments Per Week (X5), and Number of Likes Received Per Post on WeChat Moments (X6) all have

positive impact Self-Esteem (Y) no matter which categories the participants choose. All the coefficients in these regressions are positively significant.

Table 4. Regression on 6X and Y.

Table 4. Regression Results: Estimations using 6 X on Y						
	(Y)Outcome: Self-Esteem	**(Y)Outcome: Self-Esteem**	**(Y)Outcome: Self-Esteem**	**(Y)Outcome: Self-Esteem**	**(Y)Outcome: Self-Esteem**	**(Y)Outcome: Self-Esteem**
X1. Social Media Intensity	0.0886(1.66)					
X2. Total Year Usage		X21 26.88***(9.15) X22 26.28***(9.80) X23 27.47***(10.37) X24 27.50***(10.24)				
X3. Daily Usage Hours			X31 27.16***(10.44) X32 28.02***(10.37) X33 26.26***(8.97) X34 30.92***(9.25) X35 29.49***(4.47)			
X4. Number of Friends				X41 23.12***(7.89) X42 24.18***(9.01) X43 24.77***(9.41) X44 29.19***(10.69) X45 32.55***(8.42)		

Table 4 Continued.

X5.Posts Per Week					X51 p_week27.12***(10.37) X52 p_week 28.03***(10.29) X53 p_week 27.09***(8.40) X54 p_week 27.39***(7.29) X55 p_week 21.03**(3.14)	
X6. Likes Per Posts						X61 24.36***(9.01) X62 25.22***(9.14) X63 24.08***(8.95) X64 25.48***(9.77) X65 30.17***(11.40)
Control Variable						
Major	Y	Y	Y	Y	Y	Y
Gender	Y	Y	Y	Y	Y	Y
Income	Y	Y	Y	Y	Y	Y
Class Standings	Y	Y	Y	Y	Y	Y
N of Observations	299	299	299	299	299	299

Moderation Effect Hypothesis Test

Because Xs are categorical variables, to include all the categories and avoid collinearity at the same time, running regression should not include the constant term and no baseline. Therefore, to answer H2 to H4, this study uses model 2 below. 6 predictors, 10 moderators were tested by using Ordinary Least Squares (OLS) regressions. As a result, a total of 60 regressions have been conducted in STATA software. See Table 5 below.

Model 2: $Y_{Self-Esteem} = aX_{Social\ Media\ Usage} + bW + cX_{Social\ Media\ Usage}W$

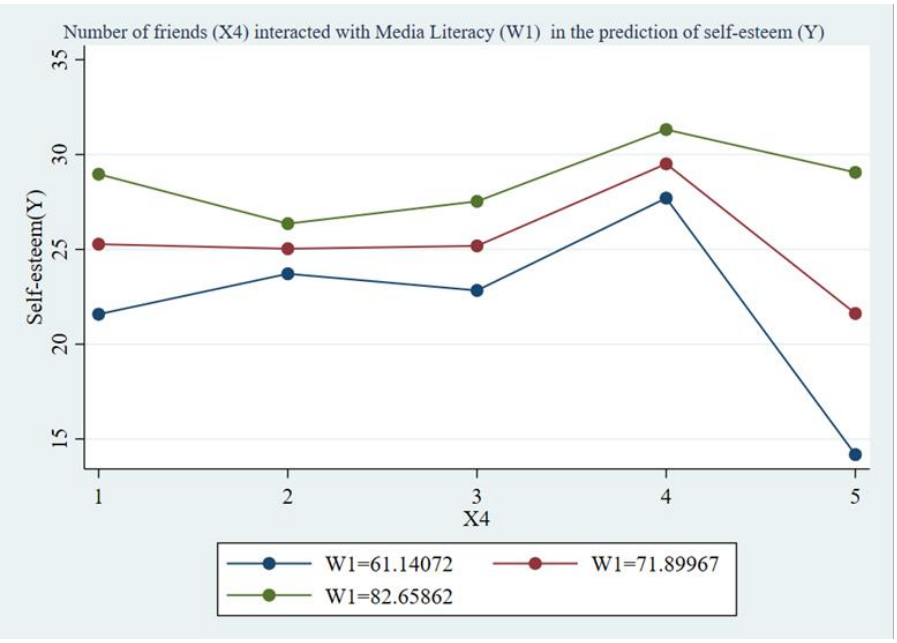
In this model, three coefficients are all tested. Nevertheless, only the coefficient c represents the moderation effect on a certain moderator (W1 to W10) when a specific predictor (X1 to X6) impacts the final outcome. In this regression model, if a is significant but b and c are not, that means X impacts Y. If b is significant, but c is not, that means W impacts Y directly, and it does not have a moderation effect. If c is significant, that means W's moderation effect works on X and Y. Thus, to test H2 to H4, c is the key number.

H2 is to test using X1 to X6 with using media literacy as moderator W1 on Y Self-Esteem. 6 regressions are conducted to test H2. Results show that media literacy only negatively moderates those who choose friends number from the 20-50 category. The coefficient is ‐ 0.569*, and the standard deviation is -2.04. It only works on this particular category as the predictor, but media literacy does not have any moderate effect on the other categories of friends numbers or any other five Xs with Y. A further R square different test is used to test its strength. Thus, H2 is partially supported because it

does negatively debuff the influence of the number of friends on self-esteem. See Table 5 below.

Further, checking the delta R-square (some called squared semi-partial correlation coefficient) can determine whether a variable has a substantial effect on an outcome. Results can be seen in Table 5. Although media literacy has moderation functions, it does not show strong strength. See Table 5 and Figure 5 below.

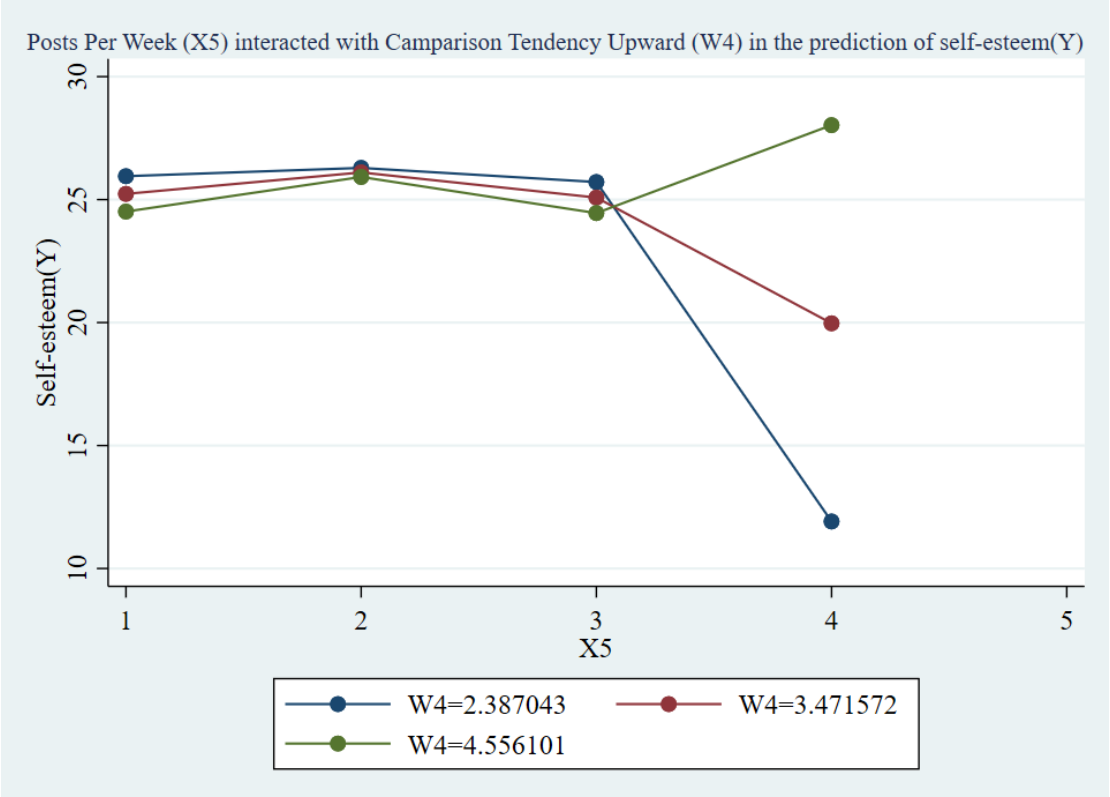
Figure 5. Moderation Effects: Media literacy (W1) on Number of Friends (X4) and Self-Esteem (Y)



H3 tests the potential moderating effects of comparison tendencies (W2 to W5) in associations among X1 to X6 and Y; 24 regressions are used to test the hypothesis. Results show that the tendency to compare opinion and ability as well as the tendency to make downward comparisons do not have any moderation effect. However, the upward comparison tendency negatively moderates the positive association between the number of posts per week X5 and self-esteem Y. Coefficients are -8.093* (SD = -2.19), -7.600* (

SD = -2.04), and - 8.012* (SD = -2.01). See Table 6 below. The following R^2 test does not show a strong strength in terms of the moderation effect. See Table 7 and Figure 6 below.

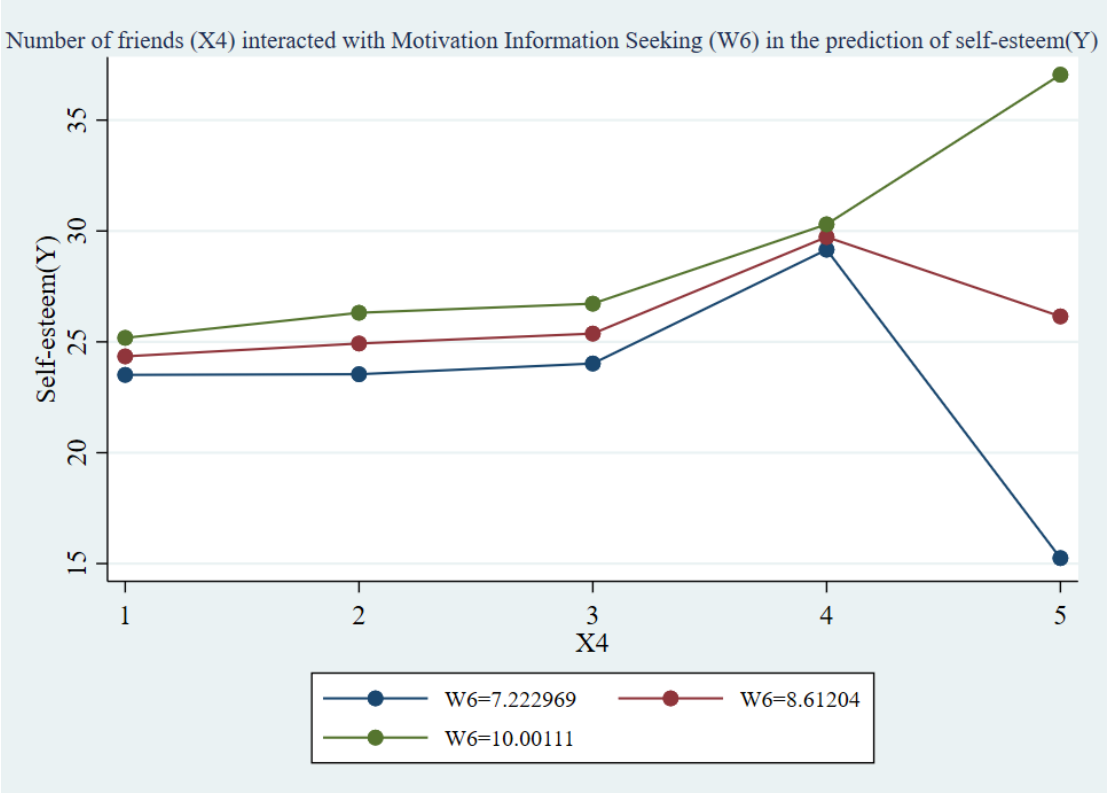
Figure 6. Moderation Effects: Upward Comparison Tendency (W4) on Post Per Week (X5) and Self-Esteem (Y)



H4 is to test the potential moderation effect of W6-W10 in associations among X1 to X6, and Y. 30 regressions are conducted in STATA to test this hypothesis. Results show that when people's motivations for using WeChat Moments are making connections, exposing themselves, and making social influence, there are no moderation effects. Meanwhile, when people's motivation is to seek information, it negatively moderates the association between friends' numbers and self-esteem. Coefficients are -

7.246* (SD = -2.07), -6.849* (SD = -1.98), -6.876* (SD = -1.97), and -7.436* (SD = -2.03). A follow-up R^2 difference calculation does not show significance in terms of its effect strength. See Table 5 and Figure 7 below.

Figure 7. Moderation Effects: Information Seeking (W6) on Number of Friends (X4) and Self-Esteem (Y)



When people's goal is to coordinate via WeChat Moments, particularly for the people who use WeChat Moments less than a month, motivation for coordination on WeChat Moments (W10) positively moderates the association between total year usage (X2) and self-esteem (Y). The coefficient is 1.793*, with a standard deviation of 2.03. This moderation effect does not work for all other people who use WeChat Moments for longer than a month. Therefore, it is a very weak moderation effect, as the following R^2 difference test indicated. See Table 5 and Figure 8 below.

Figure 8. Moderation Effects: Coordination (W10) on Total Year Usage (X2) and Self-Esteem (Y)

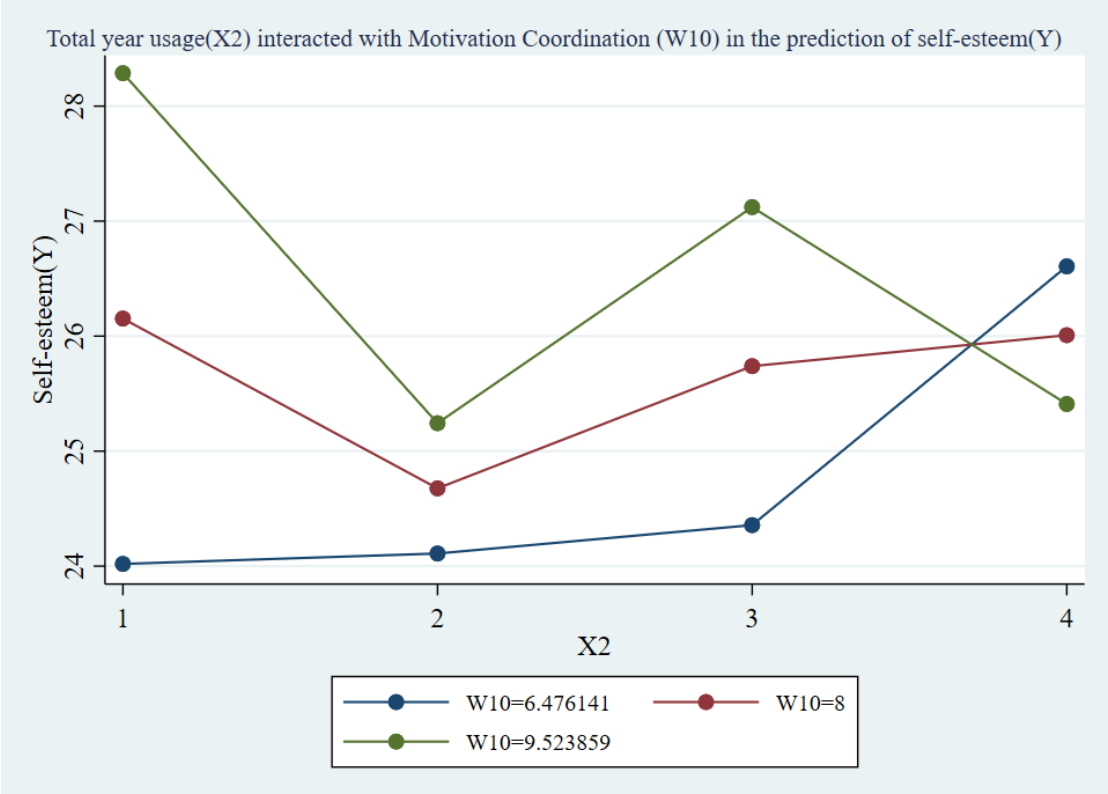


Table 5. Regression Results: Moderation Effects Estimation Using 6 Predictors And 10 Moderators

Table 5. Regression Results: Moderation Effects Estimation using 6 Predictors and 10 Moderators						
(Y)Outcome: Self-Esteem **(X)Predictor: X1-X6** **(W)Moderator: 1-10**	**X1. Social media Intensity**	**X2. Total Year Usage**	**X3. Daily Usage Hours**	**X4. Number of Friends**	**X5. Posts Per Week**	**X6. Likes Per Posts**
W1. Media Literacy	B Sig X1W1 0.313**(2.97)	B Sig X2W1 0.195** (2.78)	A Sig X31W1 15.01*** (3.86)	B Sig X4W1 0.692* (2.50)	A Sig X51W1 13.90*** (3.71)	B Sig X6W1 0.204* (2.00)
		A Sig X23W1 15.34*** (3.73)	A Sig X32W1 10.99* (2.29)	A Sig X42W1 16.22*** (4.19)	A Sig X52W1 13.90*** (3.71)	A Sig on X63W1 15.44** (3.00)
		A Sig X24W1 12.87* (2.15)		C Neg Sig X42#W1 -0.569* (-2.04)		A Sig on X64W1 12.16** (2.85)
W2. Comparison Tendency: Opinion	N/A	A Sig X21W2 21.50***(3.57)	A Sig X31W2 22.55*** (7.05)	A Sig X41W2 22.67*** (4.41)	A Sig X51W2 22.98*** (7.40)	A Sig X61W2 25.99***(4.20)
		A Sig X22W2 23.59*** (4.99)	A Sig X32W2 24.93*** (5.08)	A Sig X42W2 22.01*** (6.03)	A Sig X52W2 22.06*** (3.97)	A Sig X62W2 21.64*** (4.21)
		A Sig X23W2 19.88*** (5.37)	A Sig X33W2 22.78** (2.66)	A Sig X43W2 17.56*** (4.24)		A Sig X63W2 26.10*** (5.90)
		A Sig X24W2 26.05*** (5.92)		A Sig X44W2 21.49** (3.12)		A Sig X64W2 16.89*** (4.48)
				A Sig X45W2 43.40** (2.62)		A Sig X65W2 27.16*** (4.62)
W3. Comparison Tendency: Ability	N/A	A Sig X21W3 28.35*** (6.22)	A Sig X31W3 27.42*** (9.11)	A Sig X41W3 22.18*** (4.99)	A Sig X51W3 27.77*** (9.55)	A Sig X61W3 31.28*** (5.87)
		A Sig X22W3 25.61*** (7.16)	A Sig X32W3 26.27*** (7.29)	A Sig X42W3 25.50*** (8.06)	A Sig X52W3 24.14*** (6.41)	A Sig X62W3 22.40*** (6.13)
		A Sig X23W3 27.14*** (8.28)	A Sig X33W3 28.70*** (4.93)	A Sig X43W3 24.55*** (7.22)	A Sig X53W3 19.52* (2.15)	A Sig X63W3 24.91*** (7.33)
		A Sig X24W3 26.32*** (7.43)	A Sig X34W3 27.68*** (4.62)	A Sig X44W3 27.58*** (5.35)		A Sig X64W3 26.65*** (7.54)
			A Sig X35W3 26.77*** (3.38)	A Sig X45 34.68* (2.16)		A Sig X65W3 30.23*** (8.07)
W4. Comparison Tendency: Upward	B Sig X1W4 4.385*** (7.48)	A Sig X21W4 26.32*** (7.32)	A Sig X31W4 26.07*** (11.38)	A Sig X41W4 24.98*** (7.06)	B Sig X51W4 7.430* (2.03)	A Sig X61W4 31.08***(-9.6)
		A Sig X22W4 26.78*** (7.76)	A Sig X32W4 27.52*** (9.50)	A Sig X42W4 27.94*** (12.03)		A Sig X62W4 25.67*** (7.25)
		A Sig X23W4 26.83*** (10.55)	A Sig X33W4 32.47*** (5.66)	A Sig X43W4 28.29*** (10.21)		A Sig X63W4 26.31*** (10.38)

Table 5 Continued.

		A Sig X24W4 29.24*** (9.35)	A Sig X34W4 33.57*** (4.70)	A Sig X44W4 28.66*** (4.50)		
	A Sig X1W4 0.921*** (9.67)		A Sig X35W4 28.65*** (4.34)	A Sig X45W4 36.13* (2.23)	A Sig X51W4 27.75*** (12.20)	A Sig X64W4 28.94*** (10.53)
					A Sig X52W4 26.91*** (9.01)	A Sig X65W4 29.62*** (5.18)
					A Sig X53W4 27.32*** (4.53)	
					C Neg Sig X51W4 -8.093* (-2.19)	
					C Neg Sig X52W4 -7.600* (-2.04)	
					C Neg Sig X53W4 -8.012* (-2.01)	
W5.. Comparison Tendency: Downward	B Neg Sig X1W5 -2.756* (-2.39)	A Sig X21W5 30.65*** (7.45)	A Sig X31W5 30.49*** (10.48)	A Sig X41W5 24.21*** (5.91)	A Sig X51W5 30.46*** (10.50)	A Sig X61W5 30.75*** (7.18)
		A Sig X22W5 26.49*** (8.07)	A Sig X32W5 27.81*** (8.27)	A Sig X42W5 27.16*** (9.17)	A Sig X52W5 27.68*** (8.09)	A Sig X62W5 27.81*** (7.88)
		A Sig X23W5 30.91*** (10.08)	A Sig X33W5 27.67*** (5.67)	A Sig X43W5 27.27*** (8.13)	A Sig X53W5 26.48*** (5.34)	A Sig X63W5 26.44*** (8.44)
		A Sig X24W5 30.95*** (8.57)	A Sig X34W5 33.76*** (6.14)	A Sig X44W5 33.87*** (7.17)	A Sig X54W5 32.89*** (4.49)	A Sig X64W5 29.39*** (9.14)
			A Sig X35W5 31.12*** (4.52)	A Sig X45W5 38.43*** (4.77)	A Sig X55W5 27.84** (2.69)	A Sig X65W5 34.41*** (8.69)
W6. Motivation: Information Seeking		A Sig X22W6 21.32*** (4.91)	A Sig X31W6 19.62*** (5.59)	A Sig X41W6 19.88*** (3.86)	A Sig X51W6 19.54*** (5.75)	A Sig X61W6 21.39*** (4.28)
		A Sig X23W6 18.80*** (4.45)	A Sig X32W6 17.22** (3.27)	A Sig X42W6 17.04*** (4.42)	A Sig X52W6 21.22** (3.19)	A Sig X62W6 12.65* (2.12)
		A Sig X24W6 18.86** (3.17)	A Sig X33W6 37.22** (2.83)	A Sig X43W6 17.72*** (3.53)		A Sig X63W6 21.19*** (4.35)
				A Sig X44W6 26.90** (2.70)		A Sig X64W6 14.43** (3.13)
				C Neg Sig X4#1W6 -7.246* (-2.07)		A Sig X65W6 27.76** (2.81)
				C Neg Sig X42#W6 -6.849* (-1.98)		
				C Neg Sig X43#W6 -6.876* (-1.97)		

Table 5 Continued.

				C Neg Sig X44#W6 -7.436*(-2.03)		
W7. Motivation: Connection	N/A	A Sig X22W7 24.45*** (5.54)	A Sig X31W7 21.99*** (6.01)	A Sig X41W7 22.43*** (4.16)	A Sig X51W7 20.66*** (5.70)	A Sig X61W7 15.99** (3.13)
		A Sig X23W7 19.46*** (4.28)	A Sig X32W7 18.65** (3.09)	A Sig X42WW7 16.97*** (4.25)	A Sig X52W7 20.71*** (3.50)	A Sig X62W7 18.77* (2.59)
		A Sig X24W7 21.30** (2.88)	A Sig X33W7 23.60* (2.38)	A Sig X43W7 19.71*** (3.64)		A Sig X63W7 27.67*** (5.52)
				A Sig X44W7 29.21** (2.84)		A Sig X64W7 14.03** (2.84)
				A Sig X45W7 32.41** (2.71)		A Sig X65W7 28.00** (3.29)
W8. Motivation: Exposure	N/A	A Sig X22W8 24.93*** (5.24)	A Sig X31W8 23.08*** (6.19)	A Sig X41W8 22.97*** (4.01)	A Sig X51W8 21.48*** (5.79)	A Sig X61W8 25.34*** (4.45)
		A Sig X23W8 19.80*** (4.52)	A Sig X32W8 19.52*** (3.46)	A Sig X42W8 17.51*** (4.25)	A Sig X52W8 25.56*** (4.35)	A Sig X62W8 17.85** (2.92)
		A Sig X24W8 21.53*** (3.47)		A Sig X43W8 20.46*** (4.00)		A Sig X63W8 24.64*** (4.66)
				A Sig X44W8 26.70** (2.70)		A Sig X64W8 16.28*** (3.37)
						A Sig X65W8 24.36** (2.88)
W9. Motivation: Social Influence	N/A	A Sig X21W9 24.56*** (5.97)	A Sig X31W9 25.15*** (8.38)	A Sig X41W9 20.09*** (4.99)	A Sig X51W9 24.38*** (8.13)	A Sig X61W9 23.46*** (5.81)
		A Sig X22W9 21.30*** (6.09)	A Sig X32W9 23.75*** (6.67)	A Sig X42W9 21.89*** (7.12)	A Sig X52W9 25.22*** (6.44)	A Sig X62W9 20.97*** (6.03)
		A Sig X23W9 25.80*** (8.12)	A Sig X33W9 8.868 (1.37)	A Sig X43W9 20.63*** (5.88)	A Sig X53W9 20.71** (2.76)	A Sig X63W9 23.01*** (6.73)
		A Sig X24W9 22.53*** (6.18)	A Sig X34W9 21.74** (3.07)	A Sig X44W9 30.03*** (5.19)		A Sig X64W9 22.70*** (6.74)
			A Sig X35W9 25.66*** (3.70)	A Sig X45W9 44.96** 2.70)		A Sig X65W9 28.35*** (5.71)
W10. Motivation: Coordination	N/A	A Sig X21W10 16.85** (2.87)	A Sig X31W10 22.84*** 6.96)	A Sig X41W10 21.73*** 4.23)	A Sig X51W10 24.28*** (7.37)	A Sig X61W10 23.46*** (5.01)
		A Sig X22W10 23.60***(5.86)	A Sig X32W10 25.34*** 5.36)	A Sig X42W10 21.48*** 6.21)	A Sig X52W10 19.06*** (3.45)	A Sig X62W10 19.55*** (4.04)
		A Sig X23W10 20.38*** (5.08)	A Sig X33W10 25.01* 2.39)	A Sig X43W10 19.49*** 3.98)	A Sig X53W10 19.24* (2.02)	A Sig X63W10 22.00*** (4.60)

Table 5 Continued.

		A Sig X24W10 31.05***(5.71)		A Sig X44W10 27.22** (2.68)		A Sig X64W10 21.72*** (5.07)
		C Sig X21#W10 1.793*(2.03)		A Sig X45W10 34.40* (2.15)		A Sig X65W10 23.89*** (3.44)
Control Variable						
Major	Y	Y	Y	Y	Y	Y
Gender	Y	Y	Y	Y	Y	Y
Income	Y	Y	Y	Y	Y	Y
Year of Study	Y	Y	Y	Y	Y	Y
N of Observations	299	299	299	299	299	299

CHAPTER VI - DISCUSSION

Major Findings and Discussion

The Uniqueness of WeChat Moments and its effect

This finding contradicts some previous studies which showed a clear positive association linking social media usage and self-esteem in their studies. H1 does not show a strong negative correlation in this study. No matter between the emotional predictor (X1) or the basic using habits (X2 to X5), the result shows heavier WeChat Moments usage is correlated with high self-esteem in this study. It does not indicate that heavier WeChat Moments Usage links with lower self-esteem. That means no matter how intensely one person feels about WeChat Moments or how heavily an individual uses WeChat Moments, it does not negatively associate them with their self-esteem.

This phenomenon could be caused by the uniqueness of the WeChat platform. Other similar WeChat Moments studies also do not show a negative association linking WeChat Moments use and mental well-being (or similar symptoms such as self-esteem, depression, and anxiety.) Wang et al. (2018) recruited 325 Chinese adults online and found that some variables in measuring WeChat Moments use were correlated positively with individuals' self-esteem. Qu et al. (2022) analyzed the data of 5415 cases and indicated that WeChat Moments use was not significantly associated with depression. In another interesting study, Xu et al. (2015) focused on social media usage and sleep quality by researching 2,088 undergraduate students in Chongqing, China. Their study found that undergraduates who use WeChat as a social medium tend to have fewer chances of getting a lower sleep quality. In other words, many other social media effect

studies also suggest that WeChat Moments as a platform does not negatively impact one's psychological well-being.

The positive association between WeChat Moments use and its media effect makes this study different from those based on Facebook and Twitter. Most studies show a negative correlation between social media use and self-esteem based on Facebook or Twitter (Marino et al., 2018). However, this study is based on WeChat Moments. Although WeChat Moments have similar functions just like Facebook or similar social media platforms, it has relatively different user experiences compared to those focusing on Facebook or Twitter. The uniqueness of WeChat and WeChat Moments could be either positive or negative. It could be a reason to explain why the result of studying WeChat Moments is not getting similar to the results of those studying Facebook or Twitter. This can be explained by the characteristics of media platforms, cultural backgrounds, different user habits, and the bias caused by the recommendations algorithm.

First, WeChat and WeChat Moments have stricter control in terms of registration because it requires a national ID for Chinese citizens to use. This gives other platforms relatively more accessible access to create profiles and use them more quickly. By using this way, those platforms provide more new users and feed. Nevertheless, it can also increase the number of fake accounts and inaccurate information. WeChat and its WeChat Moments require a national ID, which would cause extra steps to enter that world. WeChat Moments requires a WeChat account, and the WeChat account requires a real-name verification for users in mainland China and a cellphone number for other users. The WeChat app needs real-life national identification to use. In contrast, other

studies using platforms such as Facebook, Twitter, and similar platforms, do not need a real-life identity linkage. WeChat usually links real-life identity in two ways: direct verification and indirect verification. Some important features, such as WeChat *Pay* and health QR code for WeChat users, require direct authentication for their real-name data. Users would need to confirm their account by using an SMS code on their cell phones. Other features usually require a confirmed WeChat account. The WeChat account requires a cellphone number for verification. The cellphone number in mainland China must be registered under the real national ID. In this sense, the WeChat account is indirectly linked to a national ID number. For mainland users, the content a person posts could have a real-life result if any contents violate the law or local policies. Suppose the content creators and the audiences know their content would lead to certain legal actions later. In that case, they will have more control over selecting the published content. The audiences will have fewer opportunities for comparisons than the content on Facebook and Twitter feeds. This matches the core rationale of social comparison theory. By limiting exaggerated content, the feed on WeChat Moments results in fewer upward comparisons. Less upward comparisons make WeChat Moments *usage* less impactful on one's self-esteem. The national ID forms a real-world bond that links the virtual and real worlds. The extra steps and national ID system could limit the new guests' numbers and also their ability to share and post certain content. WeChat Moments could have less showing-off or unreal content than other platforms because of the national ID system.

The structure of friends, sometimes called the friends' circle, differs on WeChat Moments from Facebook or Twitter. On Facebook or Twitter, people can add strangers as friends relatively easier than doing so on WeChat Moments. The users on WeChat and

WeChat Moments are usually based on acquaintances or at least have shared friends or similar living/working environments. Profile ID or WeChat account QR codes are required for adding people. Random strangers on WeChat can only be added by using the nearby function, which only allows adding friends at a relatively closer distance based on their locations. In other words, the friends who post and share content via WeChat Moments are usually the people the users know in person. If knowing all the viewers online are real-life acquaintances, they can fact-check whatever one person posted. It could have a real-life result or impact because of the content posted. Posting and sharing content would be more cautious to avoid extra trouble. Less shining moments, fewer influencers, or social media stars, and less fancy and pretty showing off probably would be the reason causing the lower self-esteem. According to social comparison theory, one of the reasons that might cause lower self-esteem is the comparison to other people's shining moments. The inferiority complex is the reason to lower one's self-esteem. Therefore, because of the friends' structure of WeChat Moments, less shining or exhibitionistic content is posted or shared. The different friend structures could be a reason to reduce the negative influence.

Second, cultural background is an important factor influencing the result. Most studies are based on Western culture, but this study is based on mainland China. China is considered to have a collective culture (Hong et al., 2000) and a high-context culture (Kim et al., 1998; Kittler et al., 2010). Meanwhile, other studies are usually based on individualistic culture or low-context culture. In a collective culture, people usually pay more attention to group interests over individual achievements (Earley, 1989). This means people would sacrifice some personal achievements when they feel there are

possible conflicts in their social groups. In this case, for example, when a person is thinking about posting or sharing something if the content does not suit certain people in that group, they tend to stop posting or sharing for the group's harmony, even though sometimes this could shrink their personal achievements. A person wants to share some individual achievement content. However, suppose it is uncomfortable for some other people in that group. In that case, this person may reconsider whether sharing harms group harmony. This collectivistic culture sometimes is an invisible pressure that might shape how people use social media compared to using social media in an individualist cultural background. This invisible pressure could be a reason for controlling content and limiting the negative effect of WeChat Moments influencing self-esteem.

Similarly, in a high-context culture, when people communicate, they tend to focus more on extra or additional information, and they may not always directly say things exactly what they mean. For example, in a high-context culture, what is posted is still essential, but when and how a person posts the content is also considered important in the high-context culture. Sharing something at an inappropriate time or way of expressing it may cause other people to have uncomfortable feelings, which could later lead to annoying real-life results for that person. For example, suppose a person wants to share his opinion on certain topics, although his opinion could be wise and sophisticated. In that case, if another incident happened at the same time, that opinion could be inappropriate or incorrect by that time. By saving other people's faces, this person could avoid potential troubles or group isolation in real-life. In other words, the high-context culture could limit the showing-off content, resulting in a less negative impact on self-esteem.

These possible explanations match the rationale of the *Uses and Gratification Theory*. The *Uses and Gratification Theory* emphasize people have different purposes for using different media. In the case of using WeChat Moments, users know that a real-life linked system may cause real-life troubles if they do not use it appropriately. Even sometimes they do not think much when posting content, their friends or family, or others will have feedback reminding that person what the trouble is. As a result, WeChat Moments in mainland China is not purely a virtual social media. However, it is an extension of a person's real-life online. That could explain why no negative connection can be found.

For example, suppose a child posts something strange or some show-off content on autonomous social media. In that case, it probably will not get any real-life feedback or impact from the behavior of posting certain content. While, if posting similar stuff on a real name social media, especially with a closed-friends circle, the parents and friends probably will give some feedback. Probably because of this invisible selection of content, less annoying and troublesome content will be published on WeChat Moments. As a result, it does not form a negative association.

Thirdly, WeChat in mainland China is beyond a virtual online social media medium but a real-life online extension. Besides basic communication and access to information, the government also uses it as a platform people use daily. During the Covid-19 period, WeChat is a must-have app for people to go around because they need to show the health code to many public or private facilities and places. The health code is a color-based system that shows whether a person is affected by the Covid-19 virus. If a person has a green code, that means this person is safe and allowed to enter certain

places, while if the health code is yellow usually means that person may indirectly interact or link with a confirmed case. Thus, some places may not allow that person to use it. If it is red, that means this person is confirmed or has a possible contagion risk. The government uses this code as an indicator to limit public fear. Via this, it makes WeChat is not just a social instant messaging instrument but a must-have tool for nearly everyone during that period. Plus, because many older people must learn how to use WeChat due to the government requiring the health code system, at the same time, many of them start to learn WeChat Moments as their very first social media. The friends' structure system is mostly those they know in real life, so their posts or shares usually relate to their lives instead of showing off. That is another reason people using WeChat Moments could have a less negative association with their self-esteem because the feeds on this social medium are basically their real lives.

Additionally, WeChat Moments does not have a strong feeding algorithm to recommend strangers' content like Facebook or Twitter. For example, suppose one day, no friends post anything on their WeChat Moments. In that case, they do not have extra information on WeChat Moments until someone updates something. That limits certain content, and to some extent, it may also limit the user's experience. In exchange, the benefit of this is that the algorithm would have less chance to cause a separate online echo chamber effect or filter bubble regarding confirmation bias or self-confirmation. In contrast, on Facebook or Twitter, the algorithm will feed extra content for people to get more information to maintain their user habits—especially similar content to their belief system. With the limited algorithm's power, WeChat Moments, in this sense, provides a relatively different environment for people to access certain information.

Other findings and thoughts

The results of H2 are very interesting. Only when one person has 20-50 friends on WeChat Moments, their media literacy level will weaken the impact of the positive correlation between friends number and self-esteem. Higher media literacy will reduce the positive correlation between friends' numbers on self-esteem. In other words, people with 5-20 friends have a self-esteem score of 25, and people with 20-50 friends on WeChat Moments have a self-esteem of 30. People with a higher media literacy will have a relatively lower self-esteem score.

The negative moderation effect only works on people who have a certain range of online friends. The result shows no significant moderation effect if a person's friend's number is below or above that range. The number of friends from 20-50 is relatively small but bigger than the completely new users with no friends. Users with friends in this range may use WeChat Moments as their main communication tool to feel and sense the world. This is consistent with the argument of Valkenburg et al. (2021), in which they believe there is a U-shape association instead of a simple positive or negative association, even though no moderation effect or mediation effect has been tested there.

In theory, self-esteem should be positively linked to the number of friends one has. For example, Metzler and Scheithauer's (2017) longitude study recruited 217 adolescents from Germany's Facebook group and showed a positive link between the number of friends and self-esteem. Because people with more friends are usually extroverted, or at least have an extraversion tendency online, this outgoing personality decides a better score of self-esteem. In other words, a high number of friends and high self-esteem result from an extroverted personality. However, they also pointed out the

relationship between the number of friends and the level of cyberbullying victimization is positively associated (Peluchette et al., 2015). That means the more friends a person has online, especially in an anonymous online environment, the higher the chances of being bullied online. Among these people with a number of friends in that range, high media literacy starts to work as a negative influencer, making them doubt themselves. In other words, this is a phase of getting familiar with using social media. Possibly after this phase, when people have more friends, media literacy will not negatively moderate the positive relationship between friends number and self-esteem. Another possible explanation is that high media literacy sometimes needs to practice and apprehended in real life. This is a phase of doubt or at least a phase for these people to thoroughly understand the relationship between media literacy and the virtual world. People with a limited amount of friends tend to cherish the relationship more and treat it differently compared to those with a larger amount of friends, so that is why media literacy works in this condition.

These possible explanations only a few understand to explain this complicated phenomenon. Future studies could start from this perspective and dig deeper into this topic. Why media literacy sometimes works in a certain way could help academia understand the mechanism better and help the entire society use media literacy more effectively and efficiently.

The result of H3 means a high person's upward comparison tendency will lead to relatively lower self-esteem compared to those with a lower upward comparison tendency. Suppose a person tends to make upward social comparisons more frequently. In that case, he could report lower self-esteem than those who post a similar amount

weekly on WeChat Moments if they do not like to make upward comparisons. This can be understood as the influence of upward comparison in this particular situation, which reduces one's confidence after making upward comparisons. That consists of the social comparison theory. It slows the increase of the relationship between WeChat Moments usage and self-esteem.

Second, beyond the platform difference, the collective culture difference may play a role in influencing the negative moderation effect. China is based on a collective culture that values group harmony more than individuality. Compromising is a way to avoid unnecessary social conflict and damage. The individual personality is only welcome when it does not offend other people's real lives. Heine et al. (2001) found that East Asians were more driven by the want to improve themselves, but these drives were also motivated by a need to keep up with the group. White and Lehman (2005) believe that those with East Asian cultural origins are more likely than those with Western cultural backgrounds to make social comparisons. Campbell et al. (1996) believe that making upward comparisons will lead to more uncertainty in re-evaluating oneself. In other words, publishing and sharing content need to be carefully selected to avoid unnecessary trouble, just like in a collective culture. This study's finding is consistent with Campbell et al.'s explanation (1996). However, the rationale of this study focuses on using upward comparison as a moderator.

Lastly, it is worth pointing out the result of H4. That means when a person tends to seek information on WeChat Moments, those who have a similar amount of friends will have lower self-esteem compared to those who are not eager to seek information on WeChat Moments. When people's motivation is to coordinate through WeChat Moments,

only those who use WeChat Moments for less than a month show a negative moderation result on their self-esteem. These two findings show that the different purposes of using a specific social media have a moderation effect, but the strength is not strong.

Previous studies believe a person's internal traits make the result different. This study shows a different example in academia in studying the moderator effects on social media usage and self-esteem. The result, to some extent, emphasizes the different characteristics of social media platforms. Using WeChat Moments in this study does not show a negative association with self-esteem can be explained by checking the different backgrounds of different social platforms and their cultural environment. When a person knows that the other users can be located by the police or authority agencies, they will have different feelings compared to interacting with strangers who are completely random and anonymous. It brings an alternative perspective for future scholars to follow this lead and conduct cross-culture and cross-platform studies to research this topic so that the world can understand more about completely anonymous social media and real name-based social media.

Furthermore, in this case, social media intensity is neither associated with, nor moderate self-esteem is fascinating. In theory, social media intensity reflex the desire to use certain social media. In most other similar research, intensity is negatively correlated with lower self-esteem because when one is more devoted, the harmful part of social media causes deep wounds for them. Nevertheless, in this case, intense or not, it does not influence the outcome significantly. It is possible because of the collective culture or uniqueness of the social media platform. Future scholars should pay attention to this. Opinion, ability, downward comparisons, motivation, social influence, and exposure do

not moderate. However, the final data shows the possibility of a direct influence instead. Future studies can design a further test to discuss the relationship.

The media literacy level inquiry using the self-report questionnaire could have different interpretations and meanings by different people. In this study, interestingly, the students from media-related majors do not show any higher scores in media literacy levels from their self-reported answers. Nearly half of the participants are from media-related majors. Media-related students should involve more in media production or at least media learning in theory. This phenomenon can be explained as a Dunning–Kruger effect, which emphasizes that the professionals would underrate their knowledge, whereas the unprofessional ones usually have overconfidence (Dunning, 2011). However, it could also be a cultural reason because humility in China is seen as a decent characteristic for a person (Oc et al., 2015).

Second, the association linking social media use and self-esteem in academia is also changing. The trend shows a significant negative association before 2010, not very significant negative around 2015, to some positive association after 2018. This might be because the level of media literacy is changing. The media literacy level might change because of smartphones' popularity and new communication technologies. When new technologies emerge, previous generations must learn to suit the new change to survive. The participants in this study were born in the smartphone age. They grew up with these technologies. They knew how to use smartphones as early as they knew everything else, probably as early as they knew how to use a pen to write. This is an essential skill for this generation. If individuals' media literacy level is learnable and improvable, then the media literacy level of the entire society is improvable, too. Long-time exposure to new

media will definitely increase familiarity in interacting with new media. Thus, at least in theory, early studies should have a lower average in media literacy.

Nonetheless, social change could also change the user population, and the distribution change could improve the media literacy level of the entire society because it will eliminate those who do not fit in. Media literacy intervention was based on this concept. This study was done in 2022 during the Covid-19 Pandemic in China. Because the local policy requires a health code for people to go outside, people are forced to use smartphones. That brings a lot of older people to join in to use WeChat and WeChat Moments. The interesting thing is when the newcomers start to hijack and occupy the posts and topics on the trend of WeChat Moments. That generates a fatigue-like feeling for the younger generation. So, they start to run away using other social media or at least pay much less attention to its content (Liu & He, 2021). That could also change the protective effect of media literacy level in this study.

Limitation

This research is limited to university students in one particular university located in Shandong Province, China. That particular university could have its own subculture and rules. Students from that university do not represent all university students in China. Their ages are younger compared to the average age in other provinces. Their occupation and income structure could influence their worldview and what they value. Future studies should include participants from a bigger range. A more diverse sample or population could avoid this limitation and improve the study by adding people with different occupations or recruiting people from other places.

Further, the sample size is small, so it reflects the problems, but the findings lack generalizability. Future studies could use a bigger sample size or randomly selected sample to overcome this limitation, and it can avoid many unnecessary biases in this study.

In addition, in this area, studies focus on Chinese using WeChat Moments or people in the Western culture using Facebook or Twitter are very common. A focus group study of Westerners using WeChat or Chinese using Facebook or Twitter would be interesting in this field. It could provide insights as a comparison reference for academia to rethink the current problems and biases.

The online survey method is limited to the online questionnaire, which might contain inaccurate answers. The integrity, truthfulness, and honesty of responding to the questionnaire were hard to control. A control group experiment design would improve the accuracy of similar studies. Lastly, only measuring WeChat Moments as a social media is not as good as measuring all possible websites to make a more precise comparison.

APPENDIX A – QUESTIONNAIRE IN ENGLISH

WeChat Moments and Media Literacy Survey Questionnaire

Thank you for taking some time to participate in this questionnaire. There are 7 sections in this questionnaire. It will take about 10-15 minutes to complete the questionnaire. After completing the whole questionnaire, there will be a small gift of 10 Yuan as a token of appreciation for your participation. The red packet will be credited to your WeChat account through the default Tencent system within forty-eight hours after completing the questionnaire.

Consent to participate in the study.

Data in this research is collected in an anonymous manner, so it does not contain the collection of sensitive personal information. All research information will be used for this study only and will not be given to third parties. This research has been approved by the USM IRB under approval number 22-1181.

I understand that participation in this project is completely voluntary and that I may withdraw at any time without penalty, prejudice, or damage. All personal information will not be recorded, and relevant answers will be kept strictly confidential, including any identifiable information. I understand all procedures and their purpose. I have understood that information about all possible anticipated benefits, risks, inconveniences, or discomforts can be withdrawn from the research at any time.

To participate in the study, using the box below, select consent to participate in this research project. If you do not wish to participate in this study, please close and withdraw now.)

I agree to participate in this questionnaire study (Drag Down to Start)

Please fill out the following background information:

1. Major:
    a. Journalism/Mass Communication Related.
    b. Other. Please indicate your major _____
2. Gender:
    a. Male
    b. Female
3. Annual family income:
    a. Less than 20,000 Yuan
    b. 20,000 to 50,000 Yuan
    c. 50,000 to 100,000 Yuan
    d. 100,000 to 300,000 Yuan
    e. More than 300,000 Yuan
4. Please indicate your standing of class
    a. Freshman,
    b. Sophomore,
    c. Junior,
    d. Senior
    e. Graduate and above
    f. Other _____

Please choose the best options that best suit you from 1 to 5: 1-means I disagree strongly; 2-means I disagree; 3-means neutral; 4-means I agree; 5-means I agree strongly

5. I feel that I am a person of worth, at least on an equal basis with others.
6. I feel that I have a number of good qualities.
7. All in all, I am inclined to feel that I am a failure. *
8. I am able to do things as well as most other people.
9. I feel I do not have much to be proud of. *
10. I take a positive attitude toward myself.
11. On the whole, I am satisfied with myself.
12. I wish I could have more respect for myself. *
13. I certainly feel useless at times. *
14. At times I think I am no good at all. *

* Reverse-scored item

Please choose the best options that best suit you from 1 to 5: 1-means I disagree strongly; 2-means I disagree; 3-means neutral; 4-means I agree; 5-means I agree strongly

Directions: The term "media" used in the following items, unless otherwise specified, refers to current digital technology platforms, including but not limited to websites, online forums, social networks, video sharing sites, and virtual worlds in which

anyone can share any digital content. Please indicate how you feel about your knowledge and skills for each of the following statements.

15. I know how to use searching tools to get information needed in the media.
16. It is easy for me to make use of various media environments to reach information and I am good at catching up with the changes in the media.
17. I realize explicit and implicit media messages and I perceive different opinions and thoughts in the media
18. I notice media contents containing mobbing and violence.
19. I understand political, economical and social dimensions of media contents.
20. I can distinguish different functions of media (communication, entertainment, etc.), determine whether or not media contents have commercial messages, and I manage to fend myself from the risks and consequences caused by media contents.
21. I manage to classify media messages based on their producers, types, purposes and so on and combine media messages with my own opinions.
22. I can compare news and information across different media environments.
23. I consider media rating to choose which media contents to use and I am able to analyze positive and negative effects of media contents on individuals.
24. I can evaluate media in terms of legal and ethical rules, assess media in terms of credibility, reliability, objectivity and currency and it is easy for me to make decision about the accuracy of media messages.
25. It is easy for me to create user accounts and profiles in media environments and rate or review media contents based on my personal interests and liking

26. I can use software and hardware necessary for developing media contents (text, image, video, etc.) and I can use basic operating tools (button, hyperlinks, file transfer etc) in the media.
27. I am good at sharing digital media contents and messages on the Internet and make contribution or comments to media contents shared by others.
28. I manage to influence others' opinions by participating to social media environments and make discussions and comments to inform or direct people in the media.
29. It is easy for me to construct online identity consistent with real personal characteristics.
30. I am able to collaborate and interact with diverse media users towards a common purpose and I produce media contents respectful to people's different ideas and private lives
31. I can make contribution to media by reviewing current matters from different perspectives (social, economical, ideological etc.) and produce opposite or alternative media contents and develop original visual and textual media contents (video clips, web page, etc.)
32. It is important for me to create media contents that comply with legal and ethical rules.
33. I am skilled at designing media contents that reflect critical thinking of certain matters.

Please choose the best options that best suit you from 1 to 5: 1-means I disagree strongly; 2-means I disagree; 3-means neutral; 4-means I agree; 5-means I agree strongly

34. WeChat Moments is part of my everyday activity

35. I am proud to tell people I'm on WeChat Moments

36. WeChat Moments has become part of my daily routine

37. I feel out of touch when I haven't logged onto WeChat Moments for a while

38. I feel I am part of the WeChat Moments community

39. I would be sorry if WeChat Moments shut down

Please fill out the estimate numbers.

40. Total length of WeChat Moments use: ( ) Days

41. The number of friends on WeChat Moments.

42. Time spent on WeChat Moments everyday. Hours

43. Posting rate of WeChat Moments every week.

44. Number of Likes received on each post

Please choose the best options that best suit you from 1 to 5: 1-means I disagree strongly; 2-means I disagree; 3-means neutral; 4-means I agree; 5-means I agree strongly

45. Social media help to learn new things, to get information and to do my school work.

46. Through social media, I can get information, latest news, and learn how to do things, and provide others with information

47. I use social media to take part in online chatting or discussions

48. I use social media to communicate with friends and family, make new friends, and communicate with other people.

49. I use social media to send information in a matter of minutes
50. I use social media because it is fun, entertaining, and I enjoy it.
51. Through social media, one can gather enough information about educational opportunities, access to career and job opportunities.
52. Social media provides wider range of exposure (lot of knowledge/information)
53. Everyone uses social media, so why shouldn't I?
54. I use social media to look fashionable, and social media brings me prestige (status) in my environment
55. I like showing my activity on social media to people around me
56. I use social media to arrange, organize, coordinate and clarify how and when to communicate.
57. I use social media to coordinate a time to instant message each other

Ex1. Please choose 1.

Please choose the best options that best suit you from 1 to 5: 1-means I disagree strongly; 2-means I disagree; 3-means neutral; 4-means I agree; 5-means I agree strongly

58. When comparing myself to others on WeChat Moments, I often focus on people who are better off than you?
59. When comparing myself to others on WeChat Moments, I often focus on people who are worse off than you.

Please choose the best options that best suit you from 1 to 5: 1-means I disagree strongly; 2-means I disagree; 3-means neutral; 4-means I agree; 5-means I agree strongly

"Most people compare themselves from time to time with others. For example, compare the way they feel, their opinions, their abilities, and/or their situation with those of other people. There is nothing particularly 'good' or 'bad' about this type of comparison, and some people do it more than others. We would like to find out how often you compare yourself with other people. To do that we would like you to indicate how much you agree with each statement below by using the following scale"

60. I often compare how my loved ones (boy or girlfriend, family members, etc.) are doing with how others are doing on social media.
61. If I want to find out how well I have done something, I compare what I have done with how often others have done on social media.
62. I often compare how I am doing socially (e.g., social skills, popularity) and what I have accomplished in life with other people on social media.
63. I often like to talk with others about mutual opinions and experiences try to find out what others think who face similar problems as I face to know what others in a similar situation on social media .
64. If I want to learn more about something, I try to find out what others think about it on social media.

Ex2. Please Choose 2.

Thank you for taking time to participate in this research during your busy day. The WeChat bonus will be automatically credited to your account by the Tencent questionnaire in 48 hours. If you have any questions about this questionnaire, please do not hesitate to share your thoughts and questions to the default email. You can choose to complete the questionnaire to finish this research. Thank you.

Complete the questionnaire

APPENDIX B - QUESTIONNAIRE IN CHINESE

朋友圈与媒体素养调研问卷

感谢您能抽出时间参与本次问卷调研。本调研问卷共 7 个部分。大约需要花 10-15 分钟来完成问卷。 在完成整个问卷之后，将会有十元红包作为小礼物感谢您的参与。红包会在完整问卷的四十八小时之内，由默认腾讯系统打入您完成调研的微信账户中。

参与研究的同意书

本调研采取匿名方式收集，故不包含收集个人敏感信息。所有调研信息仅供本研究使用，不会给予第三方使用。 本调研已通过 USM IRB 审批，审批编号 22-1181。

我明白，参与本项目完全是自愿的，我可以在任何时候退出，而不会受到惩罚、损害或损失利益。所有的个人信息不会被记录，相关回答会被严格保密，包括任何可识别信息。我了解所有要遵循的程序及其目的。已明白关于所有可能预期的利益、风险、不便或不适的信息可以随时退出调研。

同意参与研究，需通过使用下面的方框选择同意来参加这个研究项目。如果您不希望参与这项研究，请现在关闭并退出。

同意参与本次问卷调研（下拉选择同意开始参与调研）

Q1. 您的专业是[单选题](若非传媒相关专业，请填写具体专业)

新闻传媒相关

其他____

Q2. 性别[单选题](请填写您的性别)

男

女

Q3. 请输入题目标题[单选题](家庭年收入)

2 万以下

2 万至 5 万

5 万至 10 万

10 万至 30 万

30 万以上

Q4. 您所在的年级[单选题](若非本科在校请标注)

大一

大二

大三

大四

研究生及以上

其他____

罗森伯格自信心量表（Rosenberg， 1965）- 测量每个人对于自我的认知和认同感。没有好坏高低之分，因为其为个人特质。Q5-Q14[矩阵量表题](请从 1 到 5 中选择最适合您的最佳选项：1-表示我非常不同意； 2-表示我不同意； 3-表示中立；4-表示我同意； 5-表示我非常同意)。分值越低表示认同度越低，反之亦然。

Q5. 我觉得我是一个有价值的人，至少在与他人平等的基础上。

Q6. 我觉得我有一些良好的品质。

Q7. 总的来说，我倾向于觉得自己很失败。

Q8. 我可以像大多数人一样做事。

Q9. 我觉得我没有什么值得骄傲的。

Q10. 我对自己持积极的态度。

Q11. 总的来说，我对自己很满意。

Q12. 我希望我能对自己有更多的尊重。

Q13. 有时候，我的确觉得自己没用。

Q14. 有时候，我觉得我自己什么也不行。

新媒介素养量表（Koc & Barut，2016）(使用说明：以下使用的“媒体”一词，除非另有说明，均指当前的数字技术平台，包括但不限于网站、论坛、社交网

络、视频共享网站以及任何人都可以在其中共享任何数字内容的虚拟世界。请指出你对自己的知识和技能在以下每项陈述中的感受 请从 1 到 5 中选择最适合您的最佳选项：1-表示我非常不同意； 2-表示我不同意； 3-表示中立；4-表示我同意； 5-表示我非常同意)。 分值越低表示认同度越低，反之亦然。

Q15. 我知道如何使用搜索工具来通过媒体来获取所需的信息。

Q16. 我很容易地利用不同的媒体环境来获取信息，并且很善于跟上媒体的趋势。

Q17. 我分得清显性和隐性的媒体信息，并能感知媒体中的不同观点和想法。

Q18. 我能注意得到媒体内容中含有聚众滋事和暴力等内容。

Q19. 我能从政治、经济和社会层面去理解媒体的内容。

Q20. 我能够区分媒体的不同功能（如传播信息、娱乐等），能够判断媒体内容是否具有商业广告信息，并能掌控并规避媒体内容带来的风险和后果。

Q21. 我设法根据媒体信息的制作者、类型、目的等对媒体信息进行分类，并将媒体信息与我自己的观点结合起来。

Q22. 我可以比较不同媒体环境中的新闻和信息。

Q23. 我会考虑媒体评级，收视点击率等来选择使用哪些媒体内容，并且我能够分析媒体内容对个体的正面和负面影响。

Q24. 我能够从法律和道德规则方面评估媒体，从可信度、可靠性、客观性和流行性方面进行评估媒体，我很容易对媒体信息的准确性做出决定。

Q25. 对我来说，很容易在媒体环境中创建用户帐户和个人资料，并根据我的个人兴趣和喜好对媒体内容进行评分评论。

Q26. 我可以使用作为开发媒体内容（如文字、图像、视频等）所需的软件和硬件，也可以使用媒体中的基本操作工具（如基本按键、超链接、文件传输等）。

Q27. 我很擅长在互联网上分享数字媒体内容和信息，并对他人分享的媒体内容做出贡献或评论。

Q28. 我设法通过参与社交媒体环境来影响他人的意见，并通过讨论和评论来告知或引导媒体相关的人。

Q29. 我很容易构建符合真实个人特征的在线身份。

Q30. 我能够与不同的媒体用户合作和互动来实现共同的目标，并且我可以制作的媒体内容尊重人们的不同想法和私人生活

Q31. 能从不同角度（社会、经济、意识形态等）审视时事，为媒体做出贡献，制作相反或另类的媒体内容，开发原创的视觉和文字媒体内容（视频剪辑、网页等）。

Q32. 对我来说创作的媒体内容符合法律和道德规则很重要。

Q33. 我善于设计一些反映批判性思考的媒体内容。

微信朋友圈使用习惯量表（Wang et al.，2018）朋友圈的感情依赖强度 Q34-Q39 朋友圈使用习惯和频率 Q40-Q44 (请从 1 到 5 中选择最适合您的最佳选

项：1-表示我非常不同意； 2-表示我不同意； 3-表示中立；4-表示我同意； 5-表示我非常同意)。分值越低表示认同度越低。

Q34. 微信朋友圈是我日常活动的一部分。

Q35. 我很自豪地告诉人们我在用朋友圈。

Q36. 微信朋友圈已经成为我日常生活的一部分。

Q37. 有段时间没登录朋友圈的话，会感觉脱节。

Q38. 我觉得我是朋友圈用户的一员。

Q39. 如果微信朋友圈关了，我会很遗憾。

Q40. 朋友圈总使用时长 (请选择与实际情况最接近的选项)。

少于一个月

1-6 个月

6 个月-2 年

2-5 年

5 年以上

Q42. 每天花在朋友圈上的时间

1 小时以下

1-2 小时

2-4 小时

4-8 小时

8 小时以上

Q41. 朋友圈好友数

50 人以下

50 至 200 人

200 至 500 人

500 至 1000 人

1000 人以上

Q43. 每周微信朋友圈发帖数

2 次以下

2-5 次

5-10 次

10-20 次

20 次以上

Q44. 每个帖子收到的点赞数

少于 5 个赞

5-10 个赞

10-20 个赞

20-50 个赞

50 个以上

社交媒体使用目的量表 (Dhir et al., 2017)- 测量个体使用社交媒体的不同目的 Q45-Q57 (请从 1 到 5 中选择最适合您的最佳选项)。1-表示我非常不同意；2-表示我不同意； 3-表示中立；4-表示我同意； 5-表示我非常同意）。分值越低表示认同度越低)。

Q.45. 社交媒体有助于学习新事物、获取信息和完成我的学业。

Q46. 通过社交媒体，我可以获取信息、最新新闻，并学习如何做一些事情，并为他人提供信息。

Q47. 我使用社交媒体参与在线聊天或讨论

Q48. 我使用社交媒体与朋友和家人交流，结交新朋友，并与其他人交流。

Q49. 我只需几分钟就可以在社交媒体上发送信息

Q50. 我使用社交媒体是因为它很有趣，娱乐性强，而且我很享受。

Q51. 通过社交媒体，人们可以收集到足够的关于教育机会、职业和工作机会的信息。

Q52. 社会媒体提供了更广泛的接触机会（比如大量知识或者信息）

Q53. 每个人都使用社交媒体，我为什么不应该呢？

Q54. 我用社交媒体来让自己看起来很时尚，并且社交媒体在我的周围给我带来了声望（地位）

Q55. 我喜欢向周围的人展示我在社交媒体上的活动

Q56. 我使用社交媒体来安排、组织、协调和澄清之后沟通的方式和时间。

Q57. 我使用社交媒体来协调时间，互相发送即时消息

Ex2.请选择 1

社会比较对象量表 （O'Brien et al., 2009）- 测量个体做社会比较时候为上行或者下行比较的倾向性。Q58-Q59(请从 1 到 5 中选择最适合您的最佳选项。1-表示我非常不同意； 2-表示我不同意； 3-表示中立；4-表示我同意； 5-表示我非常同意)。分值越低表示认同度越低)

Q58. 在朋友圈里拿自己和别人比较时，我经常会关注比你更好的人吗？

Q59. 在朋友圈里拿自己和别人比较时，我经常会关注比你还差的人。

社会比较倾向性量表 (Gibbons & Buunk, 1999) - 测量个体做社会比较多频率和倾向性。Q60-Q64 (“大多数人不时将自己与他人进行比较。例如，将个人的感受、观点、能力和/或处境与其他人进行比较。这种比较没有什么特别“好”或“坏”的地方，有些人比其他人做得更多。我们想了解您与他人比较的频率。为此，我们希望您使用以下量表表明您对以下每项陈述的同意程度”请从 1 到 5 中选择最适合您的最佳选项：1-表示我非常不同意； 2-表示我不同意；3-表示中立；4-表示我同意； 5-表示我非常同意)。分值越低表示认同度越低。

Q60. 我经常将我所爱的人（男女朋友、家人等）的表现与其他人在社交媒体上的表现进行比较。

Q61. 如果我想知道我做某事做的怎么样，我会将我所做的事情与其他人在社交媒体上做的怎么样进行比较。

Q62. 我经常在社交媒体上与其他人比较我在社会上的表现（例如社交技能、受欢迎程度）以及我在生活中取得的成就。

Q63. 我经常喜欢和别人谈论共同的观点和经历，来试着了解其他人的想法，他们与我面临的类似问题，以了解其他人在社交媒体上遇到的类似情况。

Q64. 如果我想更多地了解某事物，我会尝试在社交媒体上了解其他人对此的看法。

Ex2. 请选择 2

感谢您在忙碌中抽出时间参与本次调研，微信红包将在 48 小时由腾讯问卷自动打入您的账户。如果对本问卷有任何疑问，请不吝惜分享您的想法和问题至 maityty@163.com。您可以选择完成问卷来完成本次调研。谢谢。

完成问卷

APPENDIX C - IRB APPROVAL LETTER

Office *of*
Research Integrity

THE UNIVERSITY OF SOUTHERN MISSISSIPPI

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NOTICE OF INSTITUTIONAL REVIEW BOARD ACTION

The project below has been reviewed by The University of Southern Mississippi Institutional Review Board in accordance with Federal Drug Administration regulations (21 CFR 26, 111), Department of Health and Human Services regulations (45 CFR Part 46), and University Policy to ensure:

- The risks to subjects are minimized and reasonable in relation to the anticipated benefits.
- The selection of subjects is equitable.
- Informed consent is adequate and appropriately documented.
- Where appropriate, the research plan makes adequate provisions for monitoring the data collected to ensure the safety of the subjects.
- Where appropriate, there are adequate provisions to protect the privacy of subjects and to maintain the confidentiality of all data.
- Appropriate additional safeguards have been included to protect vulnerable subjects.
- Any unanticipated, serious, or continuing problems encountered involving risks to subjects must be reported immediately. Problems should be reported to ORI via the Incident submission on InfoEd IRB.
- The period of approval is twelve months. An application for renewal must be submitted for projects exceeding twelve months.

PROTOCOL NUMBER:	22-1181
PROJECT TITLE:	WeChat Moments usage and self-esteem: Media literacy, comparison tendency, and user motivation as Moderators
SCHOOL/PROGRAM	School of Communication
RESEARCHERS:	PI: Feng Li Investigators: Li, Feng~Xue, Fei~
IRB COMMITTEE ACTION:	Approved
CATEGORY:	Expedited Category
PERIOD OF APPROVAL:	24-Aug-2022 to 23-Aug-2023

Donald Sacco Jr.

Donald Sacco, Ph.D.
Institutional Review Board Chairperson

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