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研究論文

探討數位科技學習的風險—以臺灣青少年學生網路霸凌為例

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摘要

使用數位科技學習已經是一個重要趨勢，尤其是在疫情影響世界的時刻。但使用數位科技學習的同時，也衍生許多值得注意的風險。既然目前不會逆轉數位科技融入學生生活的方向，那就應該更加努力地來了解這些風險的細節。而其中最為嚴重的議題之一就是網路霸凌。因此本研究透過大規模的問卷調查來試圖了解臺灣青少年學生的數位生活，因為這也是網路霸凌最常發生的年齡層。因為議題的敏感性，招募參與者相對困難，許多家長與學校並未同意，本研究聯繫了近 100 所學校，最終 14 所學校，共 945 位國高中學生參與此研究。分析結果發現不僅僅是被霸凌者，霸凌者的心理狀態亦需要關注；社群媒體的了解需要更細緻，例如 Instgram 與 Facebook 顯示出不同的重點；另與數位學習社群非常相關的，就是進化中的旁觀者效應。關於如何面對、介入與處理的建議在本研究都有討論。

關鍵詞：數位學習、網路霸凌、旁觀者效應、社會支持、憂鬱

Introduction

Learning with a variety of digital technologies has been an important and almost non-stoppable trend. However, it is difficult to perfectly limit technology use solely for learning. The use of digital technologies is inevitably associated with many risks. That is, students are also likely to use digital technology tools for different purposes which could in turn trigger issues like Internet addiction and privacy boundary concerns. The present research aims to explore, arguably the serious risks revolved around digital technology use—cyberbullying. Cyberbullying, a new form of aggression in the digital spheres, has been considered a detrimental threat to individuals' mental and physical health. Past research has indicated that adolescent students, particularly during the middle school years, are more likely to be vulnerable to the negative effects associated with cyberbullying (Kowalski et al., 2014; Tokunaga, 2010). Many educators and parents used to adopt a passive strategy to face cyberbullying, this potential threat. They postpone to provide children with digital technologies and set up rules to decrease the time of use. However, this strategy is facing multiple challenges. The government has announced plans for digital learning across different school levels and has invested billions on the development. In addition to the promotion from the government including schools and other organization, the rapid growth of digital technologies has offered attractive options for socializing and entertainment. Taken together, it is reasoned to see that adolescent students would have strong motivation and need to use digital technologies. Subsequently, the impacts and frequency of cyberbullying are expected to be more than before. Therefore, this research aims to conduct a large-scale study to examine Taiwanese adolescent students and how they perceive cyberbullying, cyber-victimization, and the bystander behaviors. Perceived social support availability, will be investigated as well. The results of this research will enhance the understanding of cyberbullying phenomena in the context of Taiwanese society and will provide people in need with practical information about coping strategies and possible interventions. This research will benefit not only adolescent students but also educators and parents and the people who intend to intervene or help. Theoretical contributions will also be discussed.

It is difficult to accurately measure the prevalence of cyberbullying because of the insufficiencies in research designs (e.g., lacking a clear definition, sampling issues, methodologies) and the unwillingness to report. Generally speaking, according to the majority of published studies, the rates ranged between 20% and 40% (See Aboujaoude et al. 2015 for a review). For example, a study in Canada surveyed 2,186 middle and high school students and found that 33.7% confessed that they had been cyberbully-

ing perpetrators and 49.5% reported that they have been the victims of cyberbullying (Mishna et al., 2010). In other words, nearly half of the participants had the experience of cyber-victimization. Although the numbers may vary, they are worth serious public attention. However, even though academia has generated a great deal of research, anecdotal experiences show that the importance and influence of cyberbullying has often been underestimated in Taiwan. Many people still tend to think that cyberbullying does exist, but not as serious as traditional bullying. A common understanding is that cyberbullying is simply a portion of traditional bullying and it does not include any physical harm. The correlations with suicidality, depression, anxiety, self-harm, loneliness, and so forth, have not yet successfully prompted the general public to face this evolving issue with proper knowledge and skills.

In April 2015, a 24 year-old Taiwanese young actress committed suicide in her residence. According to her suicide note and other relevant investigations, cyberbullying was believed to be the major cause. Because of this tragedy, people started to concern about this topic again. Many people were surprised that a young adult's death was directly attributed to cyberbullying. This also made people worry about the younger individuals, such as adolescent students, who are probably more incapable of handling the stress and harm from cyberbullying. To contribute to this concern, this research will examine the three key roles in the process of cyberbullying: the bullies, the victims, and the bystanders with a large sample of Taiwanese middle school students. This research also attempts to advocate a new understanding of cyberbullying because there are several unique features that require specific knowledge for developing coping strategies.

First, cyberbullying is not a static form of aggression. It is always changing and evolving due to the new inventions and advances of digital technologies. When a different digital platform or device appears, new ways of bullying others or being bullied also emerge. Indeed, cyberbullying is a broad term which includes many different behaviors on many different platforms through various devices. Therefore, in order to effectively deal with cyberbullying, keeping up with the current digital communication technologies is critical.

Second, cyberbullying is not limited by time and location. It requires only the Internet and compatible electronic devices. It might be a bit difficult for a perpetrator to follow a victim wherever he or she goes but it would be a much easier job on the Internet. In brief, one can be bullied across platforms at any time.

Third, it is uncommon to see hundreds of or thousands of people jointly bully a victim in the offline world. However, observations indicated that cyber-victimization

was often associated with incredibly long threads of harsh and humiliating opinions from numerous individuals, even unknown strangers. Those “strangers” even didn’t know the victims; they simply joined the cyberbullying for fun or no reason. Similarly, it is difficult to aggregate a lot of strangers to carry out a bullying offline but the Internet could make it feasible. On the other hand, there is another group of unknown and arguably unlimited online audiences who do not participate in the aggressive actions called the bystanders. The amount of bystanders also makes cyberbullying very different from the traditional counterpart.

Forth, cyberbullying should not be underestimated because the words, pictures, audios, and videos can be easily saved, copied, shared, and reproduced. This means the bullying can easily start somewhere again with those records. The victims might need to live with the worries and fears throughout their entire lives.

To conclude, given the ubiquity of the Internet, cyberbullying should be regarded as an important new challenge in the modern society. Cyberbullying could cause a variety of unanticipated negative effects with its unique features. However, this is not saying that cyberbullying is more harmful than traditional bullying. A recent study even found that although both forms of bullying were related to negative outcomes, cyberbullying did not negatively affect psychological health while statistically controlling for traditional bullying (Hasel et al., 2015). They are different to some extent but also interdependent. This research will borrow knowledge from research regarding traditional bullying and focus on cyberbullying.

Therefore, the first important step this research will take is to recognize the dynamic nature of cyberbullying and to understand the factors associated with the procedures and the consequences. Subsequently, how to help the victims cope with the bullying and feel better is a critical issue. It is understandable that it is difficult to perfectly prevent cyberbullying. Thus protecting the victims from further harmful consequences must be discussed. This research will examine the role of social support with regard to the acquisition processes and the effects on buffering the adverse impacts of cyberbullying. Some previous studies have demonstrated that social support had the ability to attenuate the harm of cyber-victimization (e.g., Ybarra et al., 2014; Tennant et al., 2015; Tarablusa, Heimana, & Olenik-Shemesha, 2015). However, an interesting fact was that the majority of adolescent students showed strong preference for their peers rather than adults when they were in need of social support to cope with cyberbullying (Navarro & Serna, 2015). Ironically, although this preference seems reasonable, it is probably not

an easy choice. It should be noted that either traditional bullying or cyberbullying is often accompanied with relationship exclusion or social rejection. Hence, it is conceived that seeking social support from peers might be difficult while suffering cyberbullying. But this speculation is not hopeless. That is, it may be difficult to look for peers to talk to within one's interpersonal network but the possibility would increase if seeking support from the Internet. Online social support might offer a new window for individuals, especially adolescents, to manage the distress and emotional disturbance brought by cyberbullying. This research will help not only the youngsters but also the adults who care and intend to help understand the functional mechanisms and the effects of both online and offline social support as well as the seekers' perception of the support.

The emphasis of social support in this study is particularly important in certain Asian countries which embrace collectivism, such as Taiwan, China, and Japan. It is expected that individuals from different countries and cultural backgrounds would have different value orientations, interaction needs and goals and preferred approaches to seek out and obtain supportive messages. Research has suggested that in collectivist cultures (e.g., Taiwan, Japan) voicing distress or revealing negative emotional states is often deemed as perturbation to the harmony of the contextual group (Wellenkamp, 1995). In contrast, in individualist cultures expressing personal distress is more likely to be encouraged because this way can help individuals have higher chance to receive care, empathy and support (Burleson & Mortenson, 2003). That is, it is less common that individuals in the collectivist societies actively and openly express their negative feelings as well as activate support seeking because of the worry of affecting group harmony. It is also less common to see individuals in these societies than individuals in individualist societies to use counseling service or consult with psychiatrists. Hence, certain mediated channels that either offer individuals anonymity for interaction or eliminate the necessity to interact with others may be superior alternatives for seeking out and acquiring supportive messages for the individuals in the collectivist societies.

Moreover, research also indicated another difference about the way people communication between collectivist and individualist cultures. That is, collectivist culture is more leaning toward "high context" communication whereas individualist communication is relatively more "low context" (Gudykunst & Matsumoto, 1996; Gao & Ting-Toomey, 1998; Hall, 1976). Scholars further explained that individuals of collectivist cultures tend to rely on more subtle emotional cues, environmental signals, nonverbal messages such as body gestures to perceive, feel and understand communicative information. In contrast, individuals of individualist tend to be more dependent on overtly

and explicitly present verbal messages and on the denotative meanings of the messages.

It should be recognized that face-to-face interaction is an important way for individuals to obtain social support, but it should not be the only way, especially in collectivist societies. In the context of cyberbullying, the victims might encounter serious social rejection in their personal networks and it turns out to be difficult for them to seek out appropriate and sufficient social support. Thus, it is crucial to know whether there are different communication means to gratify their needs of social support. This research argues that the increasing access to the Internet and compatible technologies is a double-edge sword which unintendedly transforms the traditional bullying to a digital version and also offers the victims more opportunities for help. Hence, this research will examine social support as an important element that might mitigate the negative effects cyberbullying could have on the victims. One of the goals of this research is to help individuals seek out and obtain appropriate supportive from the right communication channels that could best meet their needs. It is common to see that youth advocates, such as scholars, educators, parents, counselors, and so on, strongly encourage cyberbullying victims to turn off their electronic devices or shut down the Internet completely. It seems logical to protect the victims from those online aggressions by staying away from digital technologies. However, this may be neither a long-term nor an effective strategy. Hinduja and Patchin (2009) indicated that avoiding technologies may help the victims temporarily stay away from the "crime scene" but is unable to stop many types of cyberbullying. That is, cyberbullying still exists, and may deteriorate even further. Also, it is unrealistic to ask a person, especially adolescents and young adults not to touch digital devices for a long time. Not only these technologies have already been integrated to people's many aspects of life, such as social interaction, education, and work (Sabella, Patchin, & Hinduja, 2015), but also the victims will miss important opportunities to seek and obtain support to help them come back from the distress. Generally, people have the natural tendency to look for certain kinds of social to cope with stress and negative emotion based on their needs. Some people might prefer to go to talk to friends, mentors, or counselors face-to-face, some might choose to do these online, others might even prefer to choose to find encouragement or mental support by reading a book, listening to a song, watching a movie, or visiting a blog.

Acquiring "support", "comfort", or "encouragement" from one-way media is not defined as social support transaction. But it certainly can be a buffer against the harmful outcomes of cyber-victimization. Although it is not a mainstream coping strategy per se, it is worth investigation with regard to the potential effects and how cyberbullying victims perceive the one-way support. Indeed, people sometimes feel reluctant to talk

to people or even want to stay alone when they are down, stressful, or depressed. This does not mean that these people who prefer not to interact with others do not need or do not want any support. What they need at the moment may be support or companionship from communication channels that require less or no interaction. Research has suggested that individuals did use mass media content to improve their negative moods (e.g., Knobloch& Zillmann, 2002). A new media example is that many people choose to lurk on the Internet reading other people's stories and opinions for support and encouragement. Thus, this possibility will be examined by this research in the context of cyberbullying.

In addition to cyberbullying, cyber-victimization, and ways of coping with the distress, another noteworthy element is the bystander behavior. Bystanders' intervention and apathy, and the motivations behind also play an important role in the procedure. It is arguably true that cyberbullying bystanders may be a lot for than traditional face-to-face bullying bystanders. However, the bystander effect (Latene & Darley, 1970) suggests that the bystanders can be passive and unresponsive, especially when they think that there are many people on the same boat and some of them might take the responsibility to intervene and help the victims. In addition to the amount, anonymity may also differentiate cyberbullying from the face-to-face counterpart. Nowadays people do not always have the control to remain anonymous at all times in the digital world. But this research argues that even partial anonymity can make a difference. Whether there are other factors that affect bystanders' motivation to positively intervene and help reduce the cyberbullying will be examined.

The survey design of this research allows multiple variables and complex relationships to be analyzed together. Unanticipated findings might also emerge. Although research examined cyberbullying has been done several times in Taiwan, little is known from a large-scale study. This research could provide cyberbullying victims, people who aim to help, and the general public with important insights about cyberbullying, cyber-victimization, bystander behaviors, and the buffering factors with social support being the primary focus. The results can also be of benefit to researchers and practitioners. Specifically, the results of this research can help not only increase the understanding of cyberbullying but also avoid the possibility of proposing inappropriate advice to adolescents who were under cyberbullying stress.

The goals of this research are to (1) construct a comprehensive review on previous literature with regard to cyberbullying, cyber-victimization, cyberbystander, social support, gender difference, and the psychological factors, such as depression and

loneliness, (2) collaborate with schools and recruit sufficient Taiwanese adolescents for analyses from the two major cities, (3) empirically investigate the relationships among the proposed variables, and (4) enhance understanding of the phenomenon, the consequences, and the coping suggestions.

Literature Review

Cyberbullying: Definition and Typology

As discussed earlier, cyberbullying should be seen as a type of bullying although it has certain unique features. Bullying refers to an intentional act which repeatedly hurts another mentally or physically or both (Olweus, 1999), and the victims have difficulty in defense (Rigby, 2002). According to this definition, ill intention, repetition of aggression, and power imbalance are crucial elements. Cyberbullying is defined as "an aggressive, intentional act carried out by a group or individual, using electronic forms of contact, repeatedly and over time against a victim who cannot easily defend him or herself" (Smith et al., 2008, p. 376). There are clear similarities and overlaps. The main point that differentiates traditional bullying and cyberbullying is the use of Internet and the related digital devices.

However, this widely used definition still triggered questions and debates. Slonje, Smith, & Frisen (2013) suggested that repetition and imbalance of power are two major issues. First, it is common to see the bullies engage in repetitive aggression toward the victims in the context of traditional bullying. This is not always the case within cyberbullying. A cyber-perpetrator may initiate an attack but stop after that. Nevertheless, the attack may continue by others who may be unknown bystanders. A common example is that a perpetrator uploads a picture that hurts a victim in some way and then the picture goes viral through numerous times of sharing. The repetitive harm still exists but the following acts are not carried out by the actual perpetrator. In fact, oftentimes the subsequent acts and scenarios are out of control of the perpetrator. How does this example fit in the definition above? Should the individuals who do the sharing, forwarding, or commenting also be categorized as cyber-bullies? Second, definitions of traditional bullying portrayed the victims as weak, powerless, and incapable of defending themselves. Perpetrators are advantageous in some way such as physical power, personalities, relational control, or even wealth. The power difference is clear and the perpetrators start the bully by abusing the power. The definition has difficulties in application to cyberbullying. Obviously, cyber-victims are not necessarily weak physically or psychologi-

cally. Thus, what causes the imbalance of power within cyberbullying elicits scholarly interests. Researchers have posited three guesses:

(1) *Technological expertise.* Individuals with more advanced technological skills may be more powerful on the Internet. Ybarra and Mitchell (2004) found that compared to the victims, cyber perpetrators believed that they had greater knowledge of information and communication technology. With that being said, Slonje, Smith, & Frisen (2013) argued that being technological savvy should be a minor factor because it does not require much expertise to cyberbully someone. The present study suggests that this factor should not be underrated. As discussed earlier. Cyberbully is dynamic in nature because a variety of new technologies are continuously and rapidly evolving. Thus, ways of cyberbullying as well as self-defense are also evolving. As technologies get more and more advanced and complex, technological expertise can result in great difference in power. In the meanwhile, it is also a hope for the victims to improve the situation.

(2) *Anonymity.* It is difficult to actively respond to a cyberbullying if the perpetrators behind the screen are anonymous. The harm of cyber-victimization could aggravate if the victim perceives him or herself to be the only one whose identity is forcibly revealed. A number of previous studies did indicate that in the context of cyberbullying the victims often do not know the perpetrators (Raskauskas, 2010; Smith et al., 2008). Arguably, things have changed, at least partially, with the growing popularity of online social networking sites/services (SNSs) (e.g., Facebook). Although the users of SNSs are allowed to choose to remain anonymous, SNSs usually encourage their users to use their real identities and many users do choose to reveal their identities. Because of functions that help connect people, such as sharing, tagging, and recommendation to add someone as a friend, it is increasingly difficult to keep one's anonymity on these platforms. Levels of anonymity vary across different online platforms. For example, one may have higher control over anonymity in the online gaming world than on SNSs. The present research also aims to explore this issue anonymity.

(3) *Difficulty of removing the materials*. It is conceivable that growing accumulation of unwanted comments, pictures, audios, or videos would put the cyber-victims in a difficult position. Importantly, the accumulation is likely to either increase or remain the same. Things that have been sent to the digital spheres are hard to remove and avoid. This contributes to the imbalance of power, too.

Together, this research will adopt the definition proposed by Smith et al. (2008). A receiver model will be utilized to cross check with the subjective judgments from the researchers. On the other hand, even though a perpetrator initiates an online aggression

for just one time and has nothing to do with the following aggressive acts, this research will still label the whole process a cyberbullying. Technological expertise and anonymity will also be addressed.

Impacts and Consequences

Empirical evidence revealed that cyberbullying could have a number of psychological effects on individuals, especially adolescents. Variables that have been examined include depression, anxiety, loneliness, self-esteem, suicidality, remorse, stress, embarrassment, worry, and self-harm intention (e.g., Brewer & Kerslake, 2015; Biebl et al., 2011; Campbell et al., 2012; Hinduja & Patchin, 2010; Hoff & Mitchell, 2009). Although research has prioritized the effects on mental health, somatic impacts were also analyzed, including headache, abdominal pain, and eating disorder. Moreover, cyberbullying also showed influences on behavioral changes, such as alcohol and tobacco use (Sourander et al., 2010). And due to the high prevalence among school-age adolescents, other common behavioral impacts include truancy and school avoidance (Schneider et al., 2012).

Specifically, it is noteworthy that the victims of cyberbullying are not the only ones who are negatively affected. Research has suggested that the perpetrators, the bystanders, as well as the people who have been the bullies and victims (i.e. bully-victims) could also get hurt to some extent (Garaigordobil & Onederra, 2010; Rivers & Noret, 2013). All these four roles will be examined by the present study, though bully-victims will not be the main point this time. The impacts of cyberbullying will be estimated according to the participants' subjective perceptions; objective measurements of the psychological consequences (e.g., bio-feedbacks) will not be used in this study.

Most of the effects studies were conducted in cross-sectional settings. Scant longitudinal research has been done to examine the long-term effects. A study by Schultze et al. (2012) assessed effects of cyberbullying on 223 German adolescents in a 2-5-month period and found similar psychological effects. However, more longitudinal studies are needed. As Aboujaoude et al. (2015) stated, up to now no research has been conducted to explore whether effects of cyberbullying would continue till adulthood.

Bystanders

In addition to the perpetrator and victim, another focus of this research is cyberbystander behaviors. Traditional bullying research has suggested that bystanders are important actors in the processes of bullying. Besides simply witnessing the incidence, by-

standers can reinforce the bully although they may not be labeled as bullies depending on their behaviors. Bystanders can also help mitigate or stop the bullying and these may reduce the negative effects on the victims (Pepler, Craig & O'Connel, 2010; Salmivalli, 2010). Interestingly, the majority of research in cyberbullying has emphasized whether or not bystanders would step in and assist the victims. That is, the fact that bystanders could intensify and aggravate the bullying has often been ignored. Bystanders' behaviors that could deteriorate the bullying include their approval of the bullying (e.g., teasing, laughing, booing) as well as their inaction (e.g., passive attitude, silence) (Van Cleemput, Vandebosch, & Pabian, 2014). As Hinduja & Patchin (2009) stated, "By doing nothing, bystanders are doing somethings" (p. 174). Bullies could interpret the passive attitudes and actions as positive encouragement and continue to bully or even escalate the severity of bullying (O'Connel et al., 1999).

Bystanders, especially peer bystanders, are particularly important actors within adolescent cyberbullying. Adolescent bullies engage in such behaviors typically aim for social dominance, prestige, and relational power (Bastiaensens et al., 2014; Pepler, Craig & O'Connel, 2010) and thus peer support or agreement is critical to these goals. Importantly, it is arguably true that in most bullying cases the number of bystanders is much larger than the number of perpetrators. Logically speaking, if bystanders could unite and take sides with the victims, they not only can terminate the bullying but also help reduce the harmful impacts on the victims. However, this did not occur often and that is why bullying has long been a public and academic concern. With the increasing reliance on the Internet and electronic communication devices, there may be new possibilities for cyberbystanders, compared to traditional bullying bystanders who might encounter greater social or peer pressure for their actions. Further, it is known that adolescents' behavior could be either encouraged or discouraged by peer influence. Cyberbullying and the bystander behaviors are not an exception (Festl, Sharkow, & Quandt, 2012). It is likely that bystanders are more willing and inclined to help the victims when they see other bystanders take the step to defend the victims. Also, as discussed earlier, the present research attempts to explore whether anonymity would play a role on different online platforms. In contrast, either inaction due to the perpetrator power and relational concerns or the bystander effect (i.e. diffusion of responsibility) (Latene & Darley, 1970) could make the situation worse.

The present research will address both the bright and dark side of cyberbystander behaviors. Proposed variables that might play a role for their actions are gender (Bastiaensens et al., 2014; Barlinska, Szuster, & Winiewski, 2013), social acceptance and

rejection (Jones, Manstead, & Livingstone, 2011), and empathy (Barlinska, Szuster, & Winiewski, 2013). Many studies have indicated that age is also an important factor (e.g., Van Cleemput, Vandebosch, & Pabian, 2014). However, it should be noted that this research will target only middle school adolescents who do not differ significantly in age. Age will still be tested for an exploratory purpose.

Social Support

Social support is a key element in the present study. Social support is commonly defined as a perception of being loved, valued, and cared for by others (e.g., Saylor & Leach, 2009). In the context of traditional face-to-face bullying, social support has been demonstrated to be negatively associated with probability of being the victims (Boulton & Underwood, 1992; Haynie et al., 2001; Slee & Rigby, 1993) as well as levels of negative consequences (Ybarra et al., 2014). Because of the advances in digital communication technologies, nowadays individuals have more channels to seek and acquire social support. Abundant research has suggested that both online and offline social support can be beneficial though some evidence showed that traditional in-person social support has better ability to protect individuals from harmful effects. For example, Fanti, Demetriou, and Hawa (2012) found that family social support had positive effects on both cyberbullying and cyber-victimization. Ybarra et al. (2014) indicated that face-to-face social support was more effective against victimization, whereas online social support is particularly important for LGBT youths. The present research argues that it is neither a question of better or worse nor an attempt of replacement. Similar to the discussion of traditional bullying and cyberbullying, online and offline social support are separate but closely related. Different individuals may need different types of social support. Uniqueness of online social support will be further discussed.

Computer-mediated support has been intensively researched in the past decade, due to the rapid development of digital and mobile technologies. Because of the new features of digital communication technologies, such as asynchronicity, connectivity, interactivity, and anonymity, individuals now have more choices when seeking out social support online. Past research has well documented the phenomenon that individuals attempt to look for social support on computer-supported social networks or communities, even though they realize this type of social support is given by people they barely know (e.g., McCormick & McCormick, 1992; Rice & Love, 1987). Some scholars have even argued that computer-mediated communication, in comparison to face-to-face encounters, can even provide a better environment for users to request and receive social support (Robinson & Turner, 2003). That is, computer-mediated platforms may

have the potential to surpass traditional face-to-face channels in social support transaction with regard to certain aspects, such as involving less risks, less time spent, fewer costs and restrictions. In fact, computer-mediated social support is gradually becoming a trend in the current society and a new hope for individuals who do not feel comfortable or do not have good social skills to aquire social support in vis-à-vis environments. Interestingly, many previous studies have indicated that actual support interactions did not help individuals to cope with stressful events or even made things worse, such as adding more stress or resulting in poorer adjustment (e.g., Barrera, 1986; Bolger, et al., 1996; Dunkel-Schetter & Bennett, 1990). These findings implied that there are many potential risk factors associated with actual face-to-face social support transaction, such as stigma (Wright & Bell, 2003) and unwillingness to talk. Online social support thus opens another window for certain people.

Temporal and Geographical restrictions

Computer-mediated support has been immensely credited for its ability to overcome the limitations of time and geographical distance (e.g., Braithwaite et al., 1999; Weinberg et al., 1995). The development of new communication technologies, such as the Internet and mobile devices, has offered individuals the convenience of seeking social support relatively anytime and anywhere (Wellman, 2001). However, this advantage should not be overstated. It is worth attention that computer-mediated support transactions, though convenient, may fail to occur if people are not available online when an individual happens to log on to seek support. That is, it is possible that when a person wants to log on to a virtual community to find someone to talk that nobody is there. Although online groups and message boards can partly resolve this issue, as members post messages and social support interactions may occur asynchronously, the problem that individuals cannot obtain social support at the time of need still remains. Put differently, although one can use computer-mediated channels to interact with people and activate social support seeking anytime, the support may not be offered in time and could be substantially delayed. The delay could cause some potential problems, such as missing the best point of time to provide support and adding extra stress or triggering negative moods while waiting for the responses. Face-to-face social support has the same problem too. Arguably, online environments are still better when considering temporal and geographical barriers.

Pressure to Interact

Another advantage of computer-mediated support is that individuals are allowed to only read supportive messages from others without having the pressure to reply. Research has indicated that lurking is one of the most important features that distinguish seeking out supportive messages in the computer-mediated environments from acquiring supportive messages face-to-face (Egdorf & Rahoi, 1994). It is worth attention that because lurking refers to a type of one-way support receipt, this concept can be reasonably applied to other one-way media consumption as well (e.g., watching television, listening to music, or reading books). That is, social support is helpful, but passively obtaining supportive messages is a common and important activity to many individuals too.

Further, computer-mediated support allows individuals access to different points of view from people with diverse backgrounds. Scholars have suggested that individuals consistently report that it is often difficult to obtain appropriate social support from their close relationships, such as family members or friends (e.g., Barbee et al., 1998; Brashers, Neidig & Goldsmith, 2004). These results may be due to the fact that those family members or close friends might not have the experience or have little information and understanding in terms of the illness the person is suffering. Also, members from those close relationships often have high levels of similarity in terms of backgrounds and beliefs (Botwin, Buss, & Shackeford, 1997). Accordingly, the variety of information and opinions they can provide is often restricted. In many cases, members from one's close-tie networks even try to stay away from the sensitive topics and conversations about the illness because of their awareness that they may be unable to help (Dakof & Taylor, 1990; Helgeson et al., 2000). Computer-mediated communication has the ability to improve these issues (e.g., Wright, 2002). As a result, the probability for an individual to find appropriate social support would increase.

Disadvantages of Online Social Support

It is also important to identify the disadvantages of the mediated environment. According to Wright (2002), "the inability to make physical contact with others, the lack of other nonverbal cues, flaming/off-topic remarks, greater deception, and slower feedback between sending and receiving messages than in face-to-face communication" (pp. 199). Moreover, privacy concerns have been also one of the most controversial issues in the computer-mediated communication environment (e.g., O'Neil, 2001) and this can seriously impact a social support transaction. Because the Internet can easily and quickly store and replicate a great amount of personal information and thus far there is no perfectly safe method to assure that the personal information online will not be

accessed by the third party, individuals should be careful about this risk in case the attempt to seek out support online turns out a detrimental experience.

Also, because of the increasing complexity of digital technologies, the competence and proficiency in computer and Internet skills are also crucially important for online social support transactions (Galinski, Schopler & Abel, 1997). A lack of either computer or Internet proficiency could result in stress and unwillingness or nervousness in seeking or providing social support.

However, it should be noted that some of the disadvantages can still be considered advantageous by certain individuals. For example, slower feedback or interaction in the computer-mediated environment, this kind of asynchronous communication can allow individuals who are not used to or who are not good at socializing more time to organize themselves, think about their responses, and less stress for immediate reply while seeking out social support. On the other hand, it is also likely that in some cases individuals even do not want to provide any response while under stress or in a bad mood. Regarding this point, online lurking or consuming one-way media content for supportive messages reasonably become an excellent alternative. Similarly, as discussed earlier, the lack of physical contacts with others can be favored by some individuals who feel more comfortable being anonymous while engaging in social support transactions. Nevertheless, one should be cognizant that although the feature of anonymity offers individuals several advantages, it can be counterproductive as well. For example, through the cover of anonymity, some individuals are more likely to voice harsh opinions on the Internet and this thus can cause a hostile environment that could hurt the people who are seeking supportive messages (Joinson, 1998; Preece & Ghozati, 2001).

Functional Mechanism

The theoretical framework used in this research is the buffering hypothesis (Cohen & Wills, 1985), which is one of the best-known and the most frequently used models in explaining social support effects across disciplines. It should be noted that the buffering hypothesis specifically suggests that social support only affects well-being when an individual is experiencing stress. In other words, the availability of social support will produce no help when individuals do not encounter any stressful events. The buffering hypothesis does not measure the actual social support transaction; instead, perceived social support availability is assessed. Perceived availability of social support is typically measured with self-report items asking research participants to indicate whether there is a person (e.g., a family member, a friend, or a significant other) who can listen, help, or

talk with him/her whenever he/she feels lonely or depressed, or who can explain things to make the person's situation clearer and easier to understand (e.g., Husaini et al., 1982; Zimet et al., 1998).

An issue associated with social support availability is whether an individual's actual support resources are consistent with the perception of support availability. That is, the difference or gap between one's perception of support availability and the reality (i.e. how much social support an individual would receive when he or she actually enacts support seeking) could further influence the person under stress. This perception of incongruence could aggravate the existing stress or cause other types of stress. Although this issue could negatively and seriously influence the individuals in need, the impacts and solutions of this issue have not been well explicated by past social support research. Thus, although this concern should be kept in mind, enhancing the perception of social support availability or ease of seeking social support is still expected to generate positive effects (i.e. buffer against distress, such as cyberbullying).

Together, this research will target Taiwanese middle school adolescents and conduct two interrelated studies to examine cyberbullying, cyber-victimization, and the negative consequences. Four important elements—cyber perpetrators, cyber-victims, bystanders, and bully-victims will all be studied. Whether social support, both online and offline, is effective in terms of being a buffer against the negative impacts of stress from cyber-victimization will also be analyzed. Comparisons with college-age students will also be conducted. Coping and intervention strategies will be discussed based on the results.

Methods

A cross-sectional survey was conducted to recruit Taiwanese middle school adolescent students. The present study did not offer any incentives or rewards. The researchers first contacted a key person in each target school and explain why and how this research will be conducted. After receiving the consent from the key person, the key person collaborated with the researcher to reach class teachers. Subsequently, the researcher and the trained assistants went to the classrooms to precede the data collection. Students' participation in this research is voluntary and they are able to stop taking the survey anytime. Students' anonymity will remain at all time.

Instruments

Cyberbullying and Cyber-victimization

This research adoptd a cyberbullying and victimization survey (CVS) developed by. This measure Brown, Demaray, and Secord (2010) was designed specifically for experiences that happened online. This questionnaire consisted of two subscales, one assessing cyberbullying and the other one assessing cyber-victimization. The cyberbullying subscale had 11 items. Examples are "Have you written something electronically or posted something online in order to make others laugh at someone?" The cyber-victimization subscale comprised 15 items (e.g., "Has someone posted videos of you online/electronically in order to hurt you?"). Participants were instructed to answer the questions according to their perceptions with past two or three months.

Social Support Availability

Social support availability has been well documented as a key element in the buffering hypothesis (Cohen & Wills, 1985). The Interpersonal Support Evaluation List (ISEL) developed by Cohen and Hoberman (1983) was used to measure participants' support availability. ISEL consists of 40 statements. A 4-point scale was used ranging from 1=definitely false to 4=definitely true.

Child and Adolescent Social Support Scale

Because the major target of this research is Taiwanese adolescent students, thus a social support scale specifically designed for adolescents as well as younger children, "Child and Adolescent Social Support Scale" (CASSS), was used in addition to Cohen and Hoberman's (1983) ISEL. CASSS assesses adolescents' perceived social support from their parents, teachers, classmates, and close friends. The original CASSS adopted 2 kinds of Likert scales: a 6-point scale and a 3-point scale. For the purpose of analysis convenience, it was modified to contain 6-point scales only. Example items are "My family makes it okay to ask questions" and "my peer(s) give me good advice". Previous research revealed good internal consistency for the CASSS (Tennant et al., 2015).

Loneliness

The UCLA Loneliness Scale (Russel, Peplau, & Ferguson, 1978) was used to assess adolescents' perception of loneliness and social isolation. 20 items will be rated on 4-point likert scale (e.g., "I feel as if nobody really understands me.").

Bystander Behavioral Intentions

This research measured bystanders' behavioral intentions based on a study conducted by Bastiaensens et al. (2014) from 3 aspects. First, attribution of responsibility refers to how adolescent students perceive the necessity and responsibility of doing anything with the cyberbullying. Second, whether the bystanders will actively help the victims will be assessed by questions like "would you tell the victim you think bullying is not OK", "would you comfort the victim", "would you give the victim advice", "would you report the cyberbullying incident to someone who can help", and "would you defend the victim". Third, bullying reinforcement will be assessed with items like "would share it with others to make fun of the victim/the situation", "would tell the bully you think it is funny", and "would you do something similar". Importantly, each behavioral intention was measured across different platforms (e.g., Facebook, online gaming, and online chat room) with a 7-point scale where 1 is "I would definitely not do this" and 7 is "I would definitely do this".

Empathy

Toronto Empathy Questionnaire (TEQ, Spreng et al., 2009) was used to assess participants' levels of empathy with a 5-point scale. Empathy is a relatively large concept which contains several different aspects. The questionnaire had a total of 16 statements and participants will estimate the frequency of each statement. Examples are like: "when someone else is feeling excited, I tend to get excited too" and "I find that I am "in tune" with other people's moods".

Depression

Eaton et al.'s (2004) Epidemiologic Studies Depression Scale-Revised will be used to assess students' depression. The scale contains 20 5-point items (e.g., "I have trouble keeping my eye on what I was doing", "I lost interest in my usual activities", "I had a lot of trouble getting to sleep", and "I could not focus on the important things").

Anxiety

The Social Anxiety Scale for Children-Revised (SASC-R, La Greca & Stone, 1993) was modified by the researchers for adolescents (i.e. Social Anxiety Scale for Adolescent, SAS-A) The research used this scale to measure students' perceived anxiety. The scale consisted of 18 descriptive statements to joint assess three dimensions: fear of negative evaluation (FNE) (e.g., I worry about what others think of me), social avoidance and distress-new situations (SAD-New) (e.g., I get nervous when I meet new

friends), and social avoidance and distress-general (SAD-General) (e.g., I feel shy even with the people I know well). 5-point scale ranging from 1 = not at all to 5 = all the time will be used.

Results

This study conducted a large-scale cross-sectional survey in Taipei and Kaohsiung, the two major metropolitan areas in Taiwan. The research team consisted of 7 members including a principal investigator and 6 part-time research assistants (2 graduate students and 4 college students). The research team contacted nearly 100 schools ranging from elementary schools to senior high schools by phone and further emails, where junior high school participation was an emphasis of this study. 45 schools have discussed the possibility to assisted the research team in recruiting participants but in need of further confirmation. As a result, 14 schools including 2 senior high schools and 12 junior high schools allowed the research assistants to enter some of their classes to collect data. This was consistent with the goal of this study to target teenagers.

This study is exploratory in nature. Thus, no specific theoretical predictions and path models were employed to guide the statistical analyses. Instead, analyses that emphasized the width of the interactions among variables and discussions that explore the significant relationships are two important emphases in the following sections.

Participants

Eliminating the invalid samples, a total of 945 participants were included for the follow-up analyses, where 473 (50.1%) of them were males and 472 (49.9%) of them were females. It was advantageous to have this nearly even distribution for gender comparisons, especially with this kind of large sample size. The present study aimed to focus on junior high school and high school teenagers. Their ages were supposed to be corresponding to their grades. Therefore, the questionnaire did not specifically ask them to report the numbers of their ages. The majority of participants was the 9th graders (N = 569, 60.2%), followed by the 7th graders (N = 182, 19.3%), the 8th graders (N = 173, 18.3%), the 10th graders (N = 18, 1.9%), and 11th graders (N = 3, .3%). (See Table 1 and Table 2).

Digital Efficacy, Interpersonal Relation, and Internet Use

This study also asked the participants questions that reflected their Internet uses,

which were thought to be related to the different aspects of cyberbullying. These questions included the how many hours they use the Internet per day, how many hours they use Facebook per day, how many hours they use Instagram per day, how many hours they use YouTube per day, how many hours they play mobile games per day, and how many hours they use TikTok per day. The other 2 questions were included to explore participants' perceived levels of how well they managed their interpersonal relationships and how well they operated digital products and platforms. See Table 3 for the mean scores, standard deviations, as well as the minimum and maximum. Correlational analyses showed that perceived relation scores were correlated with only digital efficacy ($r = .33$, $p < .01$), Facebook use ($r = .10$, $p < .01$), and Instagram use ($r = .13$, $p < .01$).

Gender Analyses

A series of independent sample T-tests were performed to explore the gender differences with regard to the relevant composite variables. Only significant results were reported with detail numbers.

Cyberbullying victimization

The results indicated that female participants ($M = 1.17$, $SD = .36$) reported higher levels (frequency) of perceived victimization with regard to cyberbullying than male participants ($M = 1.10$, $SD = .23$) ($t = 3.63$, $p < .001$). Although the difference was statistically significant, the mean values were lower than the preprogrammed middle point (3.5) in the scale.

Empathy, Loneliness, and Depression

The results indicated that female participants ($M = 3.48$, $SD = .50$) reported higher levels of empathy than male participants ($M = 3.32$, $SD = .54$) ($t = 4.63$, $p < .001$). Similarly, female participants ($M = 2.70$, $SD = .69$) reported higher levels of loneliness than male participants ($M = 2.60$, $SD = .69$) ($t = 2.10$, $p < .05$). Regarding a list of indicators that may be related depression such as "I felt sad", "I felt like I could not shake off the blues even with helps from my family or friends", "I was bothered by things that usually don't bother me", female participants ($M = 2.52$, $SD = .56$) reported higher frequency than male participants ($M = 2.38$, $SD = .53$) ($t = 2.41$, $p < .05$).

Social Support

Compared to male students in this study ($M = 3.46$, $SD = .86$), female students (M

= 3.59, SD = .83) also had higher levels of perceived availability of social support (t = 2.41, p < .05) suggesting that female students perceive greater ease, resources, and possibility to seek out social support.

No statistically significant gender differences were found for cyberbullying frequency, real-world bullying bystander and intervention, and cyberbullying bystander and intervention scales.

In addition to the scales discussed in the above, gender was also analyzed with the single items that asked about Internet use, digital efficacy, and interpersonal relations.

Interpersonal Relationships

Female participants (M = 6.64, SD = 1.82) reported lower scores of perceived interpersonal relationships than their male counterpart M = 6.99, SD = 2.16) (t = 2.69, p < .05), indicating that male participants believed that they were having better interpersonal interactions.

Instagram, Mobile Game, and Tik Tok

The results showed that female participants (M = 1.42, SD = 2.84) spent significantly more time using Instagram than male participants (M = .80, SD = 2.06), although no difference was found for Facebook. Male participants (M = 1.83, SD = 2.71) spent significant more time playing mobile game using their smart phones than the female participants did (M = 1.02, SD = 2.74). Female participants (M = .49, SD = 2.14), although not much, spent more time using the short-video sharing social media app, Tik Tok, than male participants did (M = .23, SD = 1.33).

Grades

4 different grades were included with the majority of the 9th graders. In line with the exploratory aim of this study, the following one-way analysis of variance tests examined the potential grade differences among the proposed variables.

Time Spent on the Internet, Facebook, and Instagram

The results revealed that there was significant difference among the four groups in terms of their time spent on the Internet (F = 11.81, p < .001). Further post hoc analyses with Scheffe's procedure showed that the differences among the 7th, 9th, and 10th were significant. To be specific, the 10th graders (M = 8.33, SD = 6.08) spent significantly more time on the Internet than the 9th graders (M = 4.32, SD = 3.11) and the 7th graders

(M = 3.20, 3.06). Similarly, the 10th graders (M = 3.08, SD = 5.75) spent significantly more time using both Facebook and Instagram than the 9th (M = 1.05, SD = 2.71) and 7th graders (M = .95, SD = 1.96).

Cyberbullying

There was significant difference among the four groups regarding perceived frequency levels of using the Internet to bully others (F = 11.81, p < .001). The 10th graders reported the highest frequency (M = 1.41, SD = .61), although the post hoc tests indicated that significant relationships were found only for the 9th (M = 1.10, SD = .31), 8th (M = 1.12, SD = .30), and 7th graders (M = 1.15, SD = .34) (F = 4.41, p < .05).

The Associations

Bivariate correlational tests were performed to exploratorily investigate the relationships among all the variables. The attempt to decipher all the significant links that were found in this study has the ability to uncover hidden knowledge with regard to cyberbullying as well as to inspire more confirmatory future studies.

Cyberbullying Bystander

The results showed that participants' perceived inclination of being a bystander while encountering a cyberbullying was negatively associated with the possibility to intervene during both real-world bullying (r =- .12, .01) and cyberbullying (r =- .12, p < 01) incidents. It was also negatively related with the frequency levels of using the Internet to bully others (r = - .13, p < .01) and empathy (r = - .21, p < .01). Cyberbullying bystander levels were positively associated with real-world bullying bystander levels (r = .71, p < .001), loneliness (r = .11, p < .001), and depression (r = .25, p < .001).

Interpersonal Relationship

The relationship scores were positively associated with both Facebook use hours (r = .11, p < .001) and Instagram use hours (r = .13, p < .001). Psychologically, relationship scores were also positively related to empathy levels (r = .11, p < .01) and perceived availability of social support (r = .30, p < .001) but negatively related to loneliness (r = .26, p < .001) and depression (r = .19, p < .001). On the other hand, both online (r = .08, p < .05) and offline bullying interventions (r = .09, p < .05) were positively associated with relationship scores, whereas offline bullying bystander levels were negatively related to relationship scores (r = - .11, p < .01). In addition, relation-

ship scores were also positively related to participants' perceived efficacy in navigating in the digital world (r = .33, p < .001).

Digital Efficacy

In addition to the link with the relationship scores, participants' perceived digital efficacy was also found to positively affect time spent on all social media platforms proposed by this research, including Facebook (r = .14, p < .001), Instagram (r = .19, p < .001), YouTube (r = .19, p < .001), Mobile Games (r = .16, p < .001), and Tik Tok (r = .09, p < .05). On the other hand, perceived digital efficacy was positively related to perceived availability of social support (r = .08, p < .05) but negatively related to perceived loneliness (r = - .09, p < .05).

Internet Hours, Cyberbullying Frequency, and Victimization

Regarding the time spent on the Internet in general, it was found to be positively related to perceived digital efficacy (r = .23, p < .001), and similarly, time spent on the social media platforms (Facebook (r = .51, p < .001), Instagram (r = .55, p < .001), YouTube (r = .57, p < .001), Mobile games (r = .40, p < .001), and Tik Tok (r = .30, p < .001)). It was positively related to grades as well (r = .16, p < .001). Time spent on the Internet was also found to positively affect both frequency of cyberbullying (r = .09, p < .01) and cyberbullying victimization (r = .08, p < .05). And it negatively affected empathy (r = - .08, p < .05) and perceived availability of social support (r = - .12, p < .001). The results revealed that the frequency levels of using the Internet tools to bully others were positively related to (1) time spent on the Internet (r = .09, p < .01), (2) cyberbullying bystander levels (r = .13, p < .01), (3) cyberbullying victimization (r = .34, p < .001), (4) real-world bullying bystander levels (r = .11, p < .01), and (5) depression levels (r = .09, p < .05). Similar to cyberbullying frequency levels, only positive correlations were found for the victimization levels, including (1) time spent on the Internet (r = .08, p < .05), (2) time spent on Instagram (r = .08, p < .05), (3) empathy (r = .13, p < .001), and (4) depression (r = .28, p < .001).

Real-world Bullying Bystander and Intervention

In addition to the significant relationships found in the above, real-world bystander levels were also found to negatively affect real-world bullying intervention (r = - .25, p < .001) as well as cyberbullying intervention (r = - .13, p < .001). Real-world bullying

bystander levels were also found to negatively affect empathy ($r = -.22$, $p < .001$) and perceived availability of social support ($r = -.10$, $p < .01$) but positively affect loneliness ($r = .11$, $p < .01$) and depression ($r = .24$, $p < .001$). The results revealed that there was a highly positive correlation between real-world bullying intervention and cyberbullying intervention where $r = .73$, $p < .001$. Positive relationships were also found for empathy ($r = .36$, $p < .001$) and perceived availability of social support ($r = .26$, $p < .001$) except loneliness ($r = -.19$, $p < .001$).

Cyberbullying Intervention

Cyberbullying intervention was positively associated with empathy ($r = .37$, $p < .001$) and perceived availability of social support ($r = .24$, $p < .001$) but negatively associated with loneliness ($r = -.19$, 001).

Empathy, Loneliness, Perceived Support Availability, and Depression

Empathy was negatively associated with loneliness ($r = -.37$, $p < .001$) but positively associated with perceived availability of social support ($r = .41$, $p < .001$). Loneliness was positively associated with depression ($r = .39$, $p < .001$) but negatively associated with perceived availability of social support ($r = -.59$, $p < .001$). Despite all other correlations, perceived availability of social support was found to negatively affect depression ($r = .14$, $p < .001$).

Discussion

The present study defined cyberbullying as a form of hostile, aggressive behaviors that intentionally targets victims and happens repeatedly over time. The victims typically do not have the ability to stop the incidents and are weak with regard to fighting, defending, and protecting for themselves. Two of the important factors involved in the processes of cyberbullying are repetition and time. Thus, this study adopted Brown, Demaray, and Secord's (2010) scale to measure how frequent participants use the Internet to bully others.

Depression

The first noticeable finding was that cyberbullying frequency was positively associated with depression. It indicated that individuals who more frequently bully others

online are more likely to suffer depression. Different from the common understanding that depression symptoms should be part of the bullying victims, cyberbullies are also likely to be depressed. Although cyberbullying may trigger excitement, satisfaction, and self-fulfillment, the bullies are also likely to be depressed. In fact, many studies also found heightened perceived depression was associated with the experience of bullying others (e.g., Brunstein et al., 2007; Fitzpatrick, Dulin, and Piko, 2010; van der Wal, de Wit, Hirasing, 2003). Depressive symptoms were specifically found to be associated with self-reported bullying levels, but not the bullying behaviors recognized by others (Totura et al., 2009). Further, Vaughn et al. (2010) analyzed a national sample in the United States and found that individuals who had bullied others were more likely to experience depression than those who did not have such history. Although the aforementioned findings provided support with that cyberbullies can also suffer depression, the reasons or functional mechanisms were not well explicated. The present study offers possible explanations or angles to examine this issue.

Deviance

In everyday life, bullying is not a common behavior among a group. Thus, performing bullying tends to differentiate one from others in a group. This deviant behavior might elevate one's perceived stress which might in turn affect depressive symptoms (Kaltiala-Heino & Fröjd, 2011). When one behaves differently, it might invite others' attention and gratify his or her vanity. However, he or she might need to face the stress revolved around the deviance in the meanwhile. But cyberbullying may not be as obvious and overt as traditional bullying, so the salience of perceived deviance may decrease.

Guilt

Although many studies suggested that bullies are related to a lack of empathy, there is still a likelihood that they would experience the emotion of guilt, especially when looking at this point longitudinally. And guilt has been linked to a variety of factors such as avoidance and withdraw (Rangganadhan & Todorov, 2010; Schmader, & Lickel, 2006) that could cause or positively affect depressive symptoms.

Bully-victims

The present study also found that there was a positive correlation between cyberbullying and cyberbullying victimization. This finding seemed to be contradictory to common understanding at the first glance. However, research has demonstrated that bullies and victims are not always mutually exclusive. Bully-victims, or aggressive victims, are defined as individuals who both suffer bullies and bully others. They are victims as well as bullies. More importantly, many studies have supported the notion that in comparison to pure bullies and pure victims, more negative effects were identified for bully-victims, such as depression, low academic competence, decreased prosocial behavior, low self-control, low social acceptance, and low self-esteem, and these may lead to behavioral problems, such as problematic drinking and disobedience of family norms. (Brunstein et al., 2007; Hanish & Guerra, 2004; Nansel et al., 2001, 2004; Schwartz, 2000). The teenage bully-victims may even be the ones who experience the worst interpersonal relationships in the classrooms (Batsche & Knoff, 1994; Schwartz, 2000). Thus, these findings about bully-victims not only showed that cyberbullies did have the probability to experience depression, which was an emphasis of this study, and other psychological and behavioral disorders, but also argued that cyberbullies (or cybervictims) may experience worse situations when they were also cybervictims (or cyberbullies).

The Direction

And again, the results were generated from correlational analyses which did not suggest a specific direction or imply causality. In other words, the relationships could be bidirectional. Some studies further confirmed this argument using a large sample (N = 845) and structural equation modeling (SEM) (Gámez-Guadix et al., 2013). The researchers found that not only cyberbullies were likely to be depressed, but also depressive symptoms increased the possibility to bully others on the Internet. And this reciprocal relation may be an indicator for people who care about cyberbullying incidents and who may have the ability to intervene, such as parents, teachers, and practitioners.

Cyberbullying Victimization

The results indicated that cyberbullying victimization was positively associated with not only cyberbullying but also empathy, loneliness, and depression. Consistent with past research, cyberbully victims showed a variety of dysfunctional psychological responses. In addition to the present study, relevant factors such as anxiety, insecurity, caution, quiet, and decreased prosocial behaviors were also found by many studies

(Craig, 1998; Kumpulainen et al., 1998; Olweus, 1993c; Perry, Kusel, & Perry, 1988; Schwartz et al., 1998). Specifically, with regard to depression, a number of studies in the context of traditional bullying, including longitudinal studies, have supported not only the relationship between cyberbullying victimization and depression, but also the possibility that the relationship can be inverse (Kaltiala-Heino, Fröjd, and Marttunen, 2010). Gámez-Guadix et al.'s (2013) study also supported this finding in the context of cyberbullying. It is important to know that although there is not surprising that the victims could feel depressed, people and the society tend to overlook that depressive symptoms may also lead to cyberbullying victimization. The worst situation is that this bidirectional relationship between these two factors continue to affect one another and thus a vicious circle is formed. Depressive symptoms could make the victims more vulnerable to cyberbullying. The reasons may vary to a great extent. For example, depressed individuals or victims may be more prone to problematic Internet use and have higher probability to encounter more or further cyberbullying. Depressed individuals or victims may behave with no confidence or need to seek out social support online and these may also put them at risk of cyberbullying.

Although the present study did not find noticeable quantifiable difference between real-world bullying and cyberbullying, the Internet does have the ability to make depressed individuals or victims experience more bullying. Because one of the important symptoms of depression is that depressed individuals often feel lonely and spend a lot of time being alone. When they are alone but not good at being alone, they are likely to be vulnerable to problematic Internet use and cyberbullying.

The results of the present study also revealed a positive relationship between cyberbullying victimization and empathy, indicating that the individuals who reported higher levels of perceived cyberbullying victimization were likely to report higher levels of empathy. Empathy refers to the psychological ability to feel, understand, and think for others. Different from some previous studies, this finding implies that the experience of being bullied online did simply and only cause negative consequences, such as the victims' anxiety, depression, withdraw, indifference, and decreased prosocial behavior. The experience also could raise the empathy levels. They suffered firsthand and knew how painful it could be. This understanding may be a key to their heightened empathy. The promising thought would be that if the victims could get over the bullying, afterwards they may become better persons who could put themselves in others' shoes. It is also possible that they could play important roles to help cyberbullying victims.

Instagram

Another interesting finding was the relationships between cyberbullying victimization and time spent on the Internet in general and time spent on Instagram specifically. The relationship with the total time spent on the Internet will be discussed further in the following section. How Instagram, which is one of the most popular social media services worldwide, could be associated with cyberbullying victimization is in need of exploration. Instagram once was a simple online service which offered the users various and convenient filters to edit their photos and share on the platform. After the popularity increased, more communication functions like discussion tread and instant messaging were added. Thus, Instagram now can be viewed just like a common social media service beyond photo sharing and archiving. According to the data of this study, cyberbullying victimization was correlated with only Instagram but no other highly popular social media such as Facebook, YouTube, Tik Tok, and mobile games. Therefore, it is critical to analyze why this digital platform could stand out with regard to cyberbullying victimization.

Gender

Importantly, the present study also found significant gender differences on cyberbullying victimization and Instagram use. Female teenage participants spent significant more time on Instagram and experience more victimization. It was also worth attention that no significant results were found for Facebook, which provides very similar online services. Female participants also spent more time using Tik Tok, which is rapidly growing in popularity and influence in Asia. Male participants spent more time playing mobile games. But both Tik Tok and playing mobile games were not significantly affect cyberbullying victimization.

Although it was unclear whether these results implied that Instagram was the place where cyberbullying happened, it should be noticed that time spent on Instagram can be linked to higher perceived victimization, especially for female teenagers. In addition, female participants also showed higher levels of perceived loneliness, empathy, and depression than male participants. This was consistent with the knowledge about the effects of cyberbullying victimization. Nevertheless, although female individuals could have higher levels of these negative psychological reactions, they also reported higher levels of perceived availability of social support, which has been identified as one of the important elements to cope with stress, reduce negative feelings, and improve mental health as well as physical health (e.g., Cohen & Willis, m1985).

Internet Uses and Digital Efficacy

The data of this study revealed that the time participants spent on the Internet in general was positively associated with their grades and other social media outlets such as Facebook, Instagram, YouTube, Tik Tok, and playing mobile games. It indicated that when participants get older, they spent more time on the Internet. This also implies that they might spend more time on various digital devices and services. In the meanwhile, logically, doing the above digital activities like using Facebook and play mobile games takes time. Thus, time spent on the Internet is likely to affect these activities that are thought to be prevalent among teenagers.

Notably, another positive relationship was found for digital efficacy. It meant participants who believed that they had stronger ability to understand and operate digital tools were likely to spent more time on the Internet, and vice versa. In other words, time spent on the Internet and digital efficacy may positively affect each other. The importance of this finding is that digital efficacy seems to be a useful indicator to observe adolescents' online behavior. If adolescents rate themselves with higher digital efficacy, they are likely to spent more time on the Internet and on the associated activities. Thus, for example, when teachers and parents notice that their adolescents have high digital efficacy, they also need to know this may also relate to adolescents' time spent on the Internet, which also relate to their time spent on many other Internet activities. Despite directly asking or measuring their time spent on the Internet, digital efficacy can also help send out similar signals information.

Digital efficacy was also found to be negatively associated with loneliness and positively associated with interpersonal relationships and perceived availability of social support. It is interesting to know that individuals who had higher confidence in their ability to use digital tools were more likely have better interpersonal relationships and more resources to seek out social support than those low in digital efficacy. This research argues that individuals who have high digital efficacy are able to spend less time figuring out how to use specific digital services and utilize them to help maintain as well as further expand their social relationships. And subsequently, these social relationships are believed to serves as the major source of social support. Thus, it is also reasonable to see that these individuals would report higher levels of perceived availability of social support. Following this logic, although time spent on the Internet in general was positively related to efficacy and seemed to increase the probability of cyberbullying victimization, individuals who had high digital efficacy may have better ability or higher chances to obtain social support to cope with stress derived from the Internet.

Cyberbullying and Victimization

Participants' time spent on the Internet was also associated with perceived cyberbullying and cyberbullying victimization. When adolescents stayed on the Internet for a longer time period, it was reasoned to conceive that the possibility of conduct cyberbullying and being cyberbullied would increase. Indeed, the proximity, ease to use, intensity of use, of the Internet could impact the probability of initiating cyberbullying and receiving cyberbullying. Therefore, it is not surprising to see many experts from relevant fields suggest that one of the best ways to cease cyberbullying is to stay away from the Internet. However, the feasibility and rationality are the two crucial problems to challenge this coping method. Specifically, it would not be feasible to completely isolate an adolescent from the Internet world. And it would not be rational to shut down the Internet in this information age. If the irreversible trend (at least for now) would be that the prevalence, proliferation, and accessibility of the Internet and the associated devices are increasing, eliminating the Internet from life, even just a period of time like when cyberbullying is happening, would not be a reasonable choice. If this trend continues, cyberbullying phenomena are likely to increase in severity and the rate of happening. Stopping the use of the Internet is not likely to succeed and this option is unfair to the cyberbullying victims. More constructive suggestions need to be proposed in collaboration with legal, systematic, educational, behavioral, and psychological strategies.

Bystanders and Interventions

The results of the present study did not show surprising findings. Cyberbullying bystander were positively associated with real-world bullying bystander but negatively associated with cyberbullying intervention and real-world bullying intervention. That is, regardless of online or offline, individuals who tend to choose to be a bystander are more likely not to intervene the bullying incidents. This research conceived that there might be a possibility that individuals who behave as bystanders in the offline world might choose to intervene when online because of empathy, the wish to help, and other relevant factors as well as the features associated with the Internet. Although this notion was not supported by the data, there is a need to continue to explore this possibility because of the rapid changing nature of digital technologies.

The results also showed that these bystanders were also characterized as lonelier and more depressed and less empathetic. It is reasonable that individuals low in empathy are more likely to choose to be bystanders during bullying incidents because they have lower ability to think for and help others. Depressed individuals often iso-

late themselves from social interactions so it they are not likely to intervene bullying incidents either. The inverse direction was also important: being a bullying bystander may increase the levels of depression. The hypothesis of feeling guilty and perceived inability to help may be the reasons. Moreover, individuals who perceive high levels of loneliness are more likely to choose to be bystanders as well. And this perception of loneliness is thought to be associated with interpersonal relationships and perceived availability of social support. Indeed, the present study found that lonelier participants reported poorer interpersonal relationships and lower perceived availability of social support. And of course these factors could make one feel lonely too. Thus, although it may not be easy to increase one's availability of social support and improve depression symptoms, it is relatively possible to design strategies, create environments, and provide resources to help reduce the perceived loneliness. This may in turn help certain bystanders to move a step forward to intervene the bullying incidents.

Social Media

The present study was particularly interested in four major social media services in Taiwan-Facebook, Instagram, YouTube, Tik Tok, plus mobile games that contain certain functions to make games also social communication tools. In addition to the aforementioned finding that time spent on Instagram was positively associated with cyberbullying victimization as well as depression, Facebook use was found to negatively affect perceived availability of social support. This is different from many studies examining online social support. Those studies posited that more time spent on social media may increase the perception of available social support because there seem to be a lot of "friends" there. It is unclear for this negative relationship. One possibility is that it is more common to see people share happy moments and beautiful appearance on the Facebook. The more time people spent on viewing this kind of "glorious" life sharing, the more likely they would feel their life quality is worse than others which may lead to depression (ie. Facebook depression) (e.g., Moreno et al., 2011). Because more people share happy lives than miserable dark sides on Facebook, it may evolve to be a place where it is hard to show weaknesses and ask for support, especially for heavy users who spend more time on viewing other people's happiness. Similarly, time spent on YouTube was also negatively associated with perceived availability of social support. To some people, it may not be surprised to see this result because YouTube is still mainly categorized as a video sharing platform; the major function of YouTube is not social connection and communication. Thus, it may not be a good place to seek out social

support. However, things might become different when taking the concept of parasocial interaction (e.g., Rubin, Perse, & Powell, 1985; Rubin & McHugh, 1987) into account. High perceived levels of parasocial interaction may turn the world behind the screen a society where “human interaction” can happen. Compared to traditional television and radio, many digital platforms offer much more choices for the development of parasocial interaction, especially YouTube, which is currently the largest online video sharing service. And it would turn YouTube to be a place where parasocial support is possible. The perceived availability of social support may also be likely to increase.

Conclusion

This research used a cross-sectional survey design and recruited nearly a thousand of participants across two major metropolitan areas in Taiwan to investigate interrelationships among a variety of demographic, psychographic, and composite variables associated with cyberbullying among adolescents (ie. teenage junior high and senior high school students). Instead of validating specific theoretical frameworks or models, this research aimed to thoroughly understand Taiwanese adolescents’ cyberbullying phenomena by exploring as many links as possible. The results have the ability to not only verify the findings in past research but also point out several different possibilities and reflections. This research contributes to the understanding of cyberbullying and uses of popular social media as well as the psychological reasoning behind the behaviors. Based on this research, future research can design a model to link specific paths, observe the phenomena longitudinally, or further construct causality using experimental designs.

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Understanding the Risks of Learning with Digital Technologies: An Example of Cyberbullying among Taiwanese Adolescent Students

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Abstract

Using digital technologies for learning has been an important trend, especially in the age of COVID-19. However, while using digital technologies, it inevitably causes certain risks. Since it has not been seen any sign that the trend of applying digital technologies for learning would reverse, more attention should be paid to understand the details of these risks. One of the most serious risks is cyberbullying. Thus, this research conducted a large-scale survey to explore the digital life among Taiwanese adolescent students who are thought to be the major victims of cyberbullying. Because of the sensitivity of this topic, it was difficult to recruit participants. After contacting nearly 100 schools, a total of 2 senior high schools and 12 junior high schools, 945 students, participated in this research. The results indicated that not only the victims, the psychological factors of the bullies should also be concerned. On the other hand, social media, such as Instagram and Facebook, has shown different influences in the realm of cyberbullying. Importantly, the evolving bystander effects were not only closely related to online learning groups, but also worthy further investigation. Suggestions for intervention and coping strategies were also discussed.

Keywords: Digital Learning, Cyberbullying, Bystander Effect, Social Support, Depression