

# Examining the Mediating Roles of Microblog Use in the Relationships between Narcissism, Social Anxiety, and Social Capital

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## ABSTRACT

*Microblog is a platform for publishing and sharing short (140 characters or less) messages with others within a user's social network – is an Internet medium that is growing exponentially and changing the way people communicate on the Internet. To explore the effect of microblogging on interpersonal relationships, this study examines the relationships between narcissism, social anxiety, and microblog use and investigates how these psychological attributes and microblog use may affect social capital. Data were gathered through an online survey of 329 young adults aged 21–30 in mainland China using snowball sampling technique. Regression results indicate the following: (1) narcissism and social anxiety are positively related to the intensity of microblog use; (2) the intensity of microblog use positively predicts both types of social capital (bridging and bonding); (3) although narcissism has a positive effect on both types of social capital, this effect is partly mediated by the intensity of microblog use; (4) social anxiety is slightly positively related to bridging social capital, and this effect is perfectly mediated by the intensity of microblog use; and (5) there is a suppression effect of the intensity of microblog use between social anxiety and bonding social capital. The effect of the intensity of microblog use suppresses the negative effect of social anxiety on bonding social capital. Details about the findings will be discussed.*

*Keywords: Hyperpersonal Model, Microblog, Narcissism, Social Anxiety, Social Capital*

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## INTRODUCTION

Microblog—a platform for publishing and sharing short (140 characters or less) messages with others within a user’s social network (Murphy, 2008) — is an Internet service that is growing exponentially and changing the way people communicate online. Launched in 2006, the first microblog in the world was Twitter, which has already attracted 100 million active users (users who log in at least once a month), with half of those users signing in at least once a day (Mangalindan, 2011). In June, 2009, the Chinese government blocked Twitter and shut down a Chinese Twitter clone, Fanfou, during the sensitive 20th anniversary of the Tiananmen Square crackdown. However, a new Chinese version of Twitter, Sina Weibo, was launched in August, 2009. According to the report of the China Internet Network Information Centre (CNNIC), by the end of 2012, the number of internet users had reached 503 million people in mainland China, of which more than half are on Weibo (Mozur, 2013).

It is common to observe on microblogs that most of the users’ posts are about what they ate, where they traveled, what they have done, and who they were with. They are eager to express themselves to draw public attention and to show their uniqueness and superiority. Meanwhile, the ubiquitous nature of microblogging (since such sites can be accessed by mobile devices) provides a fertile ground for people to share their updates and photos with a large number of people anytime and anywhere. This phenomenon leads to the following question of interest: “Do narcissists use microblogs more often?” In order to test the assumption that those who like to present themselves use microblogs more often, we also want to examine, at the same time, whether those who are socially anxious frequently use microblogs. Thus, social anxiety was introduced in our conceptualization. Further, since microblogging is a social platform that serves to aggregate people with common interests, it is of great importance to study its effect on social capital. That is, it is important to examine whether those frequent users gain

more social capital than less frequent users. Although relevant research has examined the effect of social networking services (SNSs) on social capital, few studies have focused on microblogging, the nature of which differs from SNSs. More importantly, narcissism and social anxiety (i.e., a socially impaired attribute) are two opposing extremes. Our interest is to investigate whether microblog use can, in some way, ameliorate people’s social outcomes.

Researchers have argued repeatedly that Internet effects studies should take the antecedents of online communication into account and include them in more integrative Internet uses-and-effects models (Bargh, 2002; Valkenburg & Peter, 2007). The hyperpersonal model provides a useful interpersonal communication theoretical perspective for the study of microblogging because, as a computer-mediated communication (CMC) technology, microblogging affords a host of communicative advantages over face-to-face interaction (Walther, 1996). Under the hyperpersonal framework, this study examines the impacts of narcissism and social anxiety on microblog use and how these psychological attributes and microblog use influence the perceived social capital of Weibo users in mainland China.

## THEORETICAL FRAMEWORKS

### Hyperpersonal Model

The hyperpersonal model suggests that CMC users take advantage of the characteristics that CMC offers in the communication processes to enhance their relational outcomes (Walther, 1996). According to Walther, the model specifies several concurrent dynamics in sender, receiver, channel, and feedback systems that are afforded by CMC attributes. As senders, CMC users selectively self-present, revealing attitudes and aspects of the self in a controlled and socially desirable fashion. As receivers, CMC users idealize partners based on the circumstances or message elements that suggest minimal similarity or desirability. In terms of channels,

the asynchronous characteristic of CMC offers users the flexibility of time to communicate and to edit messages mindfully and deliberately. In the feedback process, the reciprocal exaggerated and biased expectancies are confirmed and magnified in the online interaction. In other words, partners will behave based on the expectation of the other.

In light of these dynamics specified in the hyperpersonal model, several mechanisms or processes inherent in CMC outlets, including a microblog, may benefit users with different social psychological characteristics, such as narcissism and social anxiety. Narcissists and anxious individuals may take advantage of microblogs to enhance their social capital. For example, first, the editability of CMC allows users to change messages and photos before they transmit their messages. Moreover, this capacity of a microblog goes beyond the traditional CMC channels such as instant messaging (IM) in which messages cannot be deleted after they have been sent. Therefore, a microblog may be an ideal place for narcissists to present themselves. Second, the asynchronous CMC allows the users to communicate on their own time without having to attend to each other at the same time. Users have enough time to deliberate on their messages. Especially for those lacking social skills in synchronous interaction, a microblog offers ample time to edit the message mindfully in order to avoid embarrassment or other negative social evaluations. Third, the physical isolation is conducive for senders to mask involuntary cues and for receivers to idealize the sender. That is, senders do not exude any adverse cues, and this absence of social cues causes the receivers to focus on cues of similarity, thereby enabling them to develop an ideal perception of the senders. Furthermore, the subsequent loops of self-presentation of senders and idealization of receivers continue to magnify the biased expectation of each other, thereby promoting the development and potential exaggeration of impressions and relationships online.

Above all, as the hyperpersonal model emphasizes, communication technology is important for individuals to perform better in social interactions. Grounded in this perspective, this study examined how microblogs can influence individuals with different personality traits (i.e., narcissism) and socially impaired attributes (e.g., social anxiety) in terms of their social outcome (i.e., social capital) in social networks.

### **Social Capital and Online Interaction**

Broadly speaking, social capital refers to the resources accumulated through interaction in social networks to provide individuals with certain benefits or values. Putnam (2000) defined social capital as social networks and their associated norms of reciprocity, confirming both the roles of cause and effect of social capital. Drawing on the work of Granovetter (1973), Putnam also defined the following two types of social capital: bridging and bonding. Bridging social capital comes from a network of weak ties. Bridging may broaden social networks to absorb useful information and resources and often occurs between individuals from different backgrounds as their loose connections lack depth. Alternatively, bonding social capital is derived from the strong ties between individuals in tightly-knit, emotionally-close relationships, such as family and close friends. The characteristics of individuals in a bonding relationship are more homogeneous, and therefore they form stronger and deeper connections that provide the exchange of emotional and substantive support.

Cyberpositivists and cyberpessimists hold conflicting views on the relationship between internet use and social capital. Echoing Putnam's (2000) "time displacement hypothesis," Nie (2001) found that Internet users had less face-to-face (FtF) interaction, much like heavy television watchers (see also Kraut et al., 1998). However, Hampton and Wellman (2003) concluded that computer-

mediated interactions had positive effects on social capital. To accommodate the competing findings, a uses and gratifications perspective was employed in past studies by considering people's various uses and motivations in the use of the medium (Ji-Young, 2006; Williams, 2006). Uses related to information seeking and sociality are positively associated with social capital. In contrast, uses related to entertainment are negatively associated with social capital. When researchers recognize the different uses of the Internet (e.g., informational, recreational, communicative, entertainment, etc.), they tend to find a positive link between certain motives for Internet use and social capital (Raacke & Bonds-Raacke, 2008). Extending this rationale to microblogging, since two important uses of Twitter are information seeking and social contact, we can assume a positive relationship between microblog use and social capital.

Valenzuela, Park, and Kee (2009) found positive relationships between the intensity of Facebook use and students' life satisfaction, social trust, civic engagement, and political participation. Donath and Boyd (2004) stated that although SNSs might not increase one's strong ties, such sites could greatly increase the number of weak ties one could form and maintain in an easy and inexpensive way. Moreover, the findings of Ellison, Steinfield, and Lampe (2006) showed that students who use Facebook more intensely report higher bridging and bonding social capital. Using a longitudinal analysis of panel data from Facebook users, Steinfield, Ellison, and Lampe (2008) found that the intensity of Facebook use in year one strongly predicted bridging social capital in year two. This finding strongly supports the directionality of the relationship between the intensity of SNS use and social capital.

Based on these prior works, we propose the following hypotheses:

**H<sub>1,1</sub>:** The intensity of microblog use will be positively associated with individuals' perceived bridging social capital.

**H<sub>1,2</sub>:** The intensity of microblog use will be positively associated with individuals' perceived bonding social capital.

## Narcissism and Microblog Use

Narcissism is characterized as a highly inflated, positive, but unrealistic, self-concept. Narcissistic people tend to seek attention and superficial and empty relationships (Campbell, 1999); are concerned about physical appearances (Ong et al., 2011; Vazire et al., 2008); and often engage in self-regulatory strategies to affirm positive self-views (Campbell & Foster, 2007). Narcissists are often skilled in dealing with new social settings and starting new relationships, using them to seek networks that can enhance their perceived status and attractiveness (Campbell & Foster, 2007). Scholars often measure a person's narcissistic personality through a scale called the "Narcissistic Personality Inventory" (NPI). Raskin and Terry (1988) proposed that narcissism includes the following seven dimensions: authority, self-sufficiency, superiority, exhibitionism, exploitativeness, vanity, and entitlement. More recently, Ackerman et al. (2011) proposed a model in which narcissism was constituted by a three-factor dimension that includes leadership/authority, grandiose exhibitionism, and entitlement/exploitativeness. Building on the Western model, Zhou and her colleagues (2009) created a Chinese version of the narcissism scale and tested it on a sample of adolescents in the Chinese context. The factor analysis resulted in the following three dimensions: authority, superiority, and self-admiration. Given the issue of cultural difference and the scant theoretical reasoning on authority and microblog use, this study indigenized the measure of narcissism by adopting 19 items from Zhou's narcissism scale as a composite measure of narcissism.

Recent studies have paid much attention to the relationship between narcissism and SNSs. Social media is a good platform for narcissists to self-regulate and control self-presentation

(e.g., conveying desirable information about themselves and posting attractive photos) and allows them to maintain a large network base of superficial relationships (e.g., virtual friends through CMC) (Ong et al., 2011). Since narcissists very often seek out public attention to maintain their self-esteem (Campbell et al., 2002), it is expected that narcissists would have more microblog friends and would update their posts and photos more frequently. Given narcissists' need to be unique and special, it is reasonable to assume that they upload what they are doing, listening to, seeing, and eating in order to make others believe that their experience is unusual. In examining narcissism and extraversion in relation to Facebook use, narcissists were found to enjoy more exhibitionism on SNSs (Bibby, 2008; Ong et al., 2011). Narcissists have higher levels of social activity in the online community (Buffardi & Campbell, 2008) and generate more self-promoting content in several aspects of the social networking webpages (Mehdizadeh, 2010). Though few research studies have focused on narcissism in the context of microblogging, the theoretical evidence and empirical work on SNSs suggest a potential relationship between narcissism and microblog use.

Therefore, we propose the following hypothesis:

**H<sub>2.1</sub>**: Subjects who score high on narcissism will exhibit a higher intensity of microblog use.

According to Campbell (2007), narcissists are skilled in forming relationships due to their strength in initiating interactions (Paulhus, 1998), being perceived as exciting (Foster, Shrira, & Campbell, 2003), socially confident (Brunell et al., 2004), and entertaining (Paulhus, 1998). Narcissism, however, is negatively linked to maintaining long-term relationships (Brunell et al., 2004; Campbell & Foster, 2002). Previous research on narcissism and interpersonal relationships is confined to FtF communication in an offline field. Given the hyperpersonal perspective discussed earlier, the feedback loops in CMC will magnify the

positive impression of narcissistic senders on receivers in mutual interaction, thereby facilitating the narcissists' long-term relationships through microblog use and subsequently enhance their social capital. Therefore, we propose the following hypotheses:

**H<sub>2.2</sub>**: Subjects who score high on narcissism will have more bridging social capital.

**H<sub>2.3</sub>**: Subjects who score high on narcissism will have more bonding social capital.

## Social Anxiety and Online Social Interaction

Social anxiety has been defined as "a state of anxiety resulting from the prospect or presence of interpersonal evaluation in real or imagined social settings" (Leary, 1983). Social anxiety is less severe than social phobia in terms of the intensity of symptoms. The symptoms of social anxiety include anxiety, depression, and an overall uncomfortable feeling that debilitates one's ability to interact socially. To a certain degree, moderate social anxiety is a common and normal phenomenon of social psychology, but an immoderate degree of such anxiety would generally inconvenience an individual's life and work.

This study utilizes two opposing perspectives (social compensation and rich-get-richer hypotheses) to investigate the relation between social anxiety and online interaction. The perspective of social compensation would suggest that people with a high level of social anxiety will use the Internet more often to engage in interaction with others to compensate for the social capital that they lack offline (McKenna, Green, & Gleason, 2002). Furthermore, such individuals take advantage of the characteristics of CMC to compensate for their deficiency in social skills in FtF communication (Walther, 1996). The anonymity, reduced social cues, and greater control over time, space, and content in an online setting helps socially anxious individuals to feel less threatened and more comfortable interacting with others (McKenna, Green, & Gleason, 2002; Stritzke, Nguyen, & Durkin,

2004). Abundant empirical evidence suggests that social anxiety was positively associated with the preference for CMC (Caplan, 2005, 2007; Feaster, 2010; Leung, 2011; Weidman, 2012) and blogging (Tian, 2013). In contrast, the rich-get-richer hypothesis holds that socially competent individuals are also more likely to engage in online communication (Kraut et al., 2002). Extraversion was shown to be positively related to online communication (Peter, Valkenburg, & Schouten, 2005) and Facebook use (Jenkins-Guarnieri, Wright, & Hudiburgh, 2012). In the sexual context, the results of Peter and Valkenburg's (2007) study were also consistent with the rich-get-richer hypothesis that sexually-permissive people and high sensation-seekers looked for casual partners online more frequently than sexually-restrictive people and low sensation-seekers.

On balance, the social compensation perspective is supported by the hyperpersonal model with much substantial empirical evidence.

Therefore, we propose the following hypothesis:

**H<sub>3.1</sub>:** Subjects who score high on social anxiety will report a higher intensity of microblog use.

Drawing on the general knowledge from social psychology, the direct association between social anxiety and social capital is expected to be negative. According to Schlenker and Leary (1982) in their self-presentational theory of social anxiety, shy people tend to experience social anxiety when they want to make a desired impression on other people but fear that they will fail to do so. Gudykunst (2005) also postulates in his anxiety/uncertainty management (AUM) theory that anxiety is a major threat that must be managed to achieve effective communication. According to this theory, once they exceed the maximum thresholds of anxiety, individuals are paralyzed with fear and cannot concentrate on the message in communication. Since socially anxious individuals usually have difficulty making a connection with others and establishing intimate relationships (Leary & Kowalski,

1995), it is reasonable to assume that they will have less weak ties (which require making shallow connections) and less strong ties (which require establishing intimacy) compared with narcissists.

Thus, we propose the following hypotheses:

**H<sub>3.2</sub>:** Subjects who score high on social anxiety will have less bonding social capital.

**H<sub>3.3</sub>:** Subjects who score high on social anxiety will have less bridging social capital.

Furthermore, given that narcissists have a higher level of social activity in both online and offline settings, microblog use may facilitate or mediate their perception of the social capital they have since they are more active in forming relationships and obtaining resources in the world of microblogging. Similarly, socially anxious individuals would have less weak ties and less strong ties since the first requires one to take the initiative to make shallow connections and the second requires one to take action to maintain intimate friendship. Thus, in light of the dynamics specified in the hyperpersonal model, including the lack of anonymity as well as the asynchronous and ubiquitous nature of microblogging, it is reasonable to assume that narcissists and socially anxious individuals can use microblogs to further enhance their bridging and bonding social capital.

Thus, we propose the following hypotheses:

**H<sub>4.1</sub>:** The intensity of microblog use will mediate between narcissism and social capital.

**H<sub>4.2</sub>:** The intensity of microblog use will mediate between social anxiety and social capital.

## METHOD

### Sampling

Data for this exploratory study were collected from a sample of 352 Weibo users using a snowball technique in mainland China. As the exploratory study is about Weibo users, using snowball sampling technique allows re-

searcher to reach a large group of Weibo users effectively via respondents' personal networks. This sampling technique is often used in studies of specific populations (Browne, 2005). A self-administered online survey was hosted on Wenjuanxing ([www.wenjuanxing.com](http://www.wenjuanxing.com)) from late November to early December, 2011. Invitations to participate in the survey were sent through microblogs (e.g., Sina Weibo) and SNSs (e.g., Renren). Respondents were requested to forward the invitations through their own networks. Of the 352 questionnaires received, 329 of the respondents were confirmed as Weibo users; thus, 329 valid questionnaires were obtained for further data analyses. Since the China's policy requires resident identity card number in registering SNS account, thus the true identity of the participants via Renren and Sina Weibo was by and large verified at the time of the survey.

The sample consisted of 64.1% females. The majority of the respondents (68%) were aged 21–25, 16.7% were aged 26–30, 6.7% were under 21, and about 8% were older than 30 years of age. Over 61% were undergraduates or bachelor's degree holders, 29% were postgraduates, and about 10% were high school students or graduates. As expected, the age and education distributions of most microblog users were young, university educated, and white collar users with a high educational background.

## Measurement

- Narcissism:** In this study, narcissism was measured using 19 items from the Narcissism Personality Questionnaire adapted from Zhou et al. (2009). A six-point Likert scale was used with 1 = strongly disagree and 6 = strongly agree. Sample items included the following: "I like looking into the mirror"; "Without making extra effort, I am always the center of focus"; "I seldom depend on others"; "Everyone likes to hear my story"; "I am more competent than others"; and "I can make everyone believe what I want them to believe." The reliability alpha was high at .86.
- Social Anxiety:** Social anxiety was measured using 18 items from the Social Anxiety Scale (SAS: La Greca & Lopez, 1998). The answers to these questions were reported on a five-point Likert scale with 1 = strongly disagree and 5 = strongly agree, exhibiting a high alpha reliability at .85. Sample items included the following: "I worry about what others say about me"; "I worry that others don't like me"; "I worry about what others think of me"; "I get nervous when I talk to peers I don't know very well"; and "I'm afraid to invite others to do things with me because they might say no." Various studies have found that this scale provides a valid and reliable social anxiety measure for either clinical or community samples (La Greca & Harrison, 2005; Lo, Wang, & Fang, 2005; Valkenburg & Peter, 2008).
- Social Capital:** To assess perceptions of social capital, the Social Capital Scale (SCS: Williams, 2006), containing 20 items that asked respondents to indicate the level of support from their relationships, was used. SCS consists of two parts that respectively measure the following two types of social capital: bonding and bridging. After deleting five items with low commonality, 15 items were factor analyzed (with eigenvalue greater than 1.0 explaining 63.57% of the variance) to ensure that the items reflected two distinct dimensions (as shown in Table 1). A five-point Likert scale was used, ranging from strongly disagree (1) to strongly agree (5), with high scores indicating greater social capital.
- Intensity of Microblog Use:** In order to measure the intensity of microblog use, similar items were adopted from a study conducted by Ellison, Steinfield, and Lampe (2007) with the measure on the intensity of Facebook use. The intensity of microblog use was operationalized as a combined measure of behavioral and attitudinal intensity. To measure the behavioral dimension, respondents were asked the following questions: (a) "In the

Table 1. Factor analysis of social capital

	Factors		Mean	SD
	1	2		
<b>Bridging social capital</b>				
1. Interacting with people online/offline makes me want to try new things.	.92		3.99	0.84
2. Talking with people online/offline makes me curious about other places in the world.	.90		4.10	0.86
3. Interacting with people online/offline makes me interested in what people unlike me are thinking.	.83		4.05	0.83
4. Interacting with people online/offline makes me feel like part of a larger community.	.81		3.86	0.86
5. Interacting with people online/offline reminds me that everyone in the world is connected.	.81		4.03	0.85
6. Interacting with people online/offline makes me interested in things that happen outside of my town.	.79		4.03	0.82
7. Interacting with people online/offline gives me new people to talk to.	.79		3.82	0.87
<b>Bonding social capital</b>				
8. The people I interact with would be good job references for me.		.85	3.68	1.00
9. There is someone I can turn to for advice about making very important decisions.		.82	3.86	1.02
10. If I needed an emergency loan of \$500, I know someone online/offline I can turn to.		.80	3.88	1.18
11. There are several people online/offline I trust to help solve my problems.		.79	3.94	1.01
12. The people I interact with would help me fight an injustice.		.76	3.71	0.94
13. When I feel lonely, there are several people online/offline I can talk to.		.74	3.88	1.02
14. The people I interact with would put their reputation on the line for me.		.69	3.62	1.04
15. The people I interact with would share their last dollar with me.		.59	4.05	0.73
Eigenvalue	7.20	2.34		
Variance explained	47.99	15.58		
Cronbach's Alpha	.90	.93		

Scale used: 1 = strongly disagree and 5 = strongly agree; N=329

past week, how much time (in minutes) did you spend on your microblog?"; (b) "How many followers do you have on Sina Weibo?"; and (c) "How many people are you followings on Sina Weibo?" To assess the attitudinal dimension, respondents were asked "How much do you agree with the following six statements?" on a five-point Likert scale ranging from strongly disagree (1) to strongly agree (5). Sample items

included the following: "Microblogging is part of my everyday activity"; "I am proud to tell people I'm using a microblog"; and "If I don't use Weibo, I think I am out-dated." All items from the behavioral and attitudinal dimensions were combined into a composite measure of the intensity of microblog use, which yielded an acceptable reliability alpha of .85.



## FINDINGS

### Hypotheses Testing

H<sub>1,1</sub> and H<sub>1,2</sub> hypothesized that the more frequently people use a microblog, the more bonding and bridging social capital they will have. Results in Tables 2 and 3 show that individuals scoring high in intensity of microblog use tended to possess more bonding and bridging social capital ( $\beta$  range from .12 to .28,  $p < .01$ ). After adding Microblog use in the regression, it explained an additional 3% and 6% of the variance in bonding social capital beyond narcissism and social anxiety respectively; and explained an additional 13% and 5% of the variance in bridging social capital beyond narcissism and social anxiety respectively. Thus, H<sub>1,1</sub> and H<sub>1,2</sub> were fully supported.

H<sub>2,1</sub> hypothesized that the more narcissistic an individual's personality, the more they will use a microblog. The hierarchical regression results of model 1 in Table 2 indicate that the narcissism personality traits were a significant predictor of the intensity of microblog use ( $\beta = .27$ ,  $p < .001$ ) after controlling for demo-

graphics. Narcissism explained an additional 7% of the variance in microblog use beyond demographics. Thus, H<sub>2,1</sub> was fully supported. H<sub>2,2</sub> and H<sub>2,3</sub> stated that the narcissists would have more bonding and bridging social capital. The results of model 2 and model 3 in Table 2 shows that, after controlling demographics, narcissism significantly predicted the bonding social capital ( $\beta = .29$ ,  $p < .001$ ) and bridging social capital ( $\beta = .47$ ,  $p < .001$ ). It explained an additional 8% of the variance in bonding social capital and 22% of the variance in bridging social capital. Thus, H<sub>2,2</sub> and H<sub>2,3</sub> were also supported.

H<sub>3,1</sub> hypothesized that subjects who score high on social anxiety will report a higher intensity of microblog use. The results in Table 3 demonstrate that social anxiety and the intensity of microblog use were significantly and positively related ( $\beta = .21$ ,  $p < .001$ ), with explaining 4% of the variance in the intensity of microblog use. Thus, H<sub>3,1</sub> was also fully supported. H<sub>3,2</sub> and H<sub>3,3</sub> hypothesized that subjects who score high on social anxiety will have less bonding and less bridging social capital. However, the results of model 5 and model 6

Table 2. Test for the mediation of the intensity of microblog use between narcissism and social capital

Models (Dependent Variable)	SE	$\beta$	R <sup>2</sup>	$\Delta R^2$	F
Model 1 (Intensity of microblog use)					
Control variables: Demographics			.10***	.10***	
Narcissism	.02	.27***	.17***	.07***	16.48***
Model 2 (Bonding social capital)					
Control variables: Demographics			.03*	.03*	
Step 1: Narcissism	.02	.29***	.11	.08***	
Step 2: Narcissism	.02	.24***			
Intensity of microblog use	.05	.18***	.14***	.03**	10.38***
Model 3 (Bridging social capital)					
Control variables: Demographics			.07***	.07***	
Step 1: Narcissism	.02	.47***	.29***	.22***	
Step 2: Narcissism	.02	.44***			
Intensity of microblog use	.03	.12*	.30*	.13*	27.93*

Note: \* $p \leq .05$ ; \*\* $p \leq .01$ ; \*\*\* $p \leq .001$ ; N=329

Table 3. Test for the mediation of the intensity of microblog use between social anxiety and social capital

Models (Dependent variable)	SE	$\beta$	$R^2$	$\Delta R^2$	F
Model 4 (Intensity of microblog use)					
Control variables: Demographics			.10***	.10***	
Social anxiety	.04	.21***	.14***	.04***	13.04***
Model 5 (Bonding social capital)					
Control variables: Demographics			.03*	.03*	
Step 1: Social anxiety	.03	-.08	.01	.04	
Step 2: Social anxiety	.03	-.14**			
Intensity of microblog use	.05	.28***	.10***	.06***	7.51***
Model 6 (Bridging social capital)					
Control variables: Demographics			.07***	.07***	
Step 1: Social anxiety	.03	.11*	.08*	.01*	
Step 2: Social anxiety	.03	.06			
Intensity of microblog use	.04	.24***	.13*	.05***	9.54***

Note: \* $p \leq .05$ ; \*\* $p \leq .01$ ; \*\*\* $p \leq .001$ ; N=329

in Table 3 indicate that, after controlling for demographics, social anxiety was slightly and positively correlated with bridging social capital ( $\beta = .11, p < .05$ ); furthermore, no significant correlation between social anxiety and bonding social capital ( $\beta = -.08, p > .05$ ) was found. Thus,  $H_{3,2}$  and  $H_{3,3}$  failed to be supported.

### Mediation Effect of Intensity of Microblog Use

According to Baron and Kenny (1986), the use of multiple regressions to estimate the mediation effect requires the following two assumptions: no measurement error in the mediator and a causal relationship between the mediator and the dependent variable. As a result of the use of multiple indicators in the construct and, furthermore, since the proposed mediator (intensity of microblog use) is an external, behavioral variable rather than an internal, psychological variable, we can minimize the measurement error. Additionally, the study conducted by Steinfield et al. (2008) demonstrated the causal effect of the intensity of SNS use and social capital. Above all, the present study arguably

satisfied the two conditions of using multiple regressions for mediation effect test.

As described by Barron and Kenny (1986), a series of regression models were estimated to test the three criteria for mediating effect as follows: (1) a significant relationship between the IV and the DV (step 1 in model 2, 3, 5, and 6); (2) a significant relationship between the IV and the mediator (model 1 and 4); and (3) the mediator must be a significant predictor of the outcome variable in an equation including both the mediator and the IV (step 2 in model 2, 3, 5, and 6).

$H_{4,1}$  hypothesized that the relationship between narcissism and social capital is mediated by the intensity of microblog use. As shown in Table 2, the supported  $H_{2,1}$ ,  $H_{2,2}$ , and  $H_{2,3}$  demonstrated that criterion 1 and 2 were satisfied. In model 2, given the demographics and narcissism, the inclusion of the intensity of microblog use accounts for an additional 3% ( $p < .01$ ) of the variance in bonding social capital and slightly reduced the regression coefficient of narcissism from .29 to .24. The decrement in the regression coefficient of narcissism reflects the

indirect effect of narcissism on bonding social capital taken by intensity of microblog use.

Similarly, in model 3 the intensity of microblog use uniquely explained 13% ( $p < .05$ ) of the variance in bridging social capital after controlling demographics and narcissism. Furthermore, the indirect effect of narcissism is .05. Above all, narcissism has a moderate indirect effect on both types of social capital through the intensity of microblog use. The Sobel tests revealed the following: the path from narcissism to bonding social capital is  $t = 3.47, p < .001$ ; while the path from narcissism to bridging social capital is  $t = 3.84, p < .001$ . Therefore, the mediation analysis fully supports the predicted indirect effect of narcissism on social capital, and this effect was mediated by the intensity of microblog use. Thus,  $H_{4.1}$  was supported.

$H_{4.2}$  hypothesized that the relationship between social anxiety and social capital is mediated by the intensity of microblog use. In model 4 and model 6 (see Table 3), the relationships between social anxiety and intensity of microblog use ( $\beta = .21, p < .001$ ) and between social anxiety and bridging social capital ( $\beta = .11, p < .05$ ) were supported. In model 6 (See Table 3), when the intensity of microblog use was included, it accounted for an additional 5% ( $p < .001$ ) of the variance in bridging social capital; as a result, the original significant social anxiety becomes insignificant. This indicates a perfect mediation of the intensity of microblog use between social anxiety and bridging social capital. The Sobel statistic is significant ( $t = 3.95, p < .001$ ). Thus, the mediating effect of the intensity of microblog use between social anxiety and bridging capital is supported.

As for the path from social anxiety to bonding social capital, significant relationships were supported between social anxiety and the intensity of microblog use ( $\beta = .21, p < .001$ ) and between the intensity of microblog use and bonding social capital ( $\beta = .28, p < .001$ ). The result of the Sobel test demonstrated a significant indirect effect ( $t = 3.83, p < .001$ ). In model 5, although there is no significant relationship between social anxiety and bonding social capital

( $\beta = -.08, p > .05$ ), after entering the intensity of microblog use, social anxiety becomes a significantly negative predictor of bonding social capital ( $\beta = -.14, p < .01$ ). As suggested by Judd and Kenny (1981), a possible mediation effect can still exist, which is known as a suppression effect (Tzelgov & Henik, 1991). This rare but important effect will be discussed in the next section. Thus,  $H_{4.2}$  was also supported.

## DISCUSSIONS AND CONCLUSION

### Direct Effects of Psychological Attributes on the Intensity of Microblog Use

The present study explores how psychological attributes influence microblog use. The results support the findings of Bibby (2008) which indicate that narcissists are more likely to be heavy users of microblogs. This means that narcissists who like to seek attention and self-admiration tend to update information and express opinions on microblogs more often as microblogs can be regarded as a platform for narcissists to control self-presentation (e.g., conveying desirable information about themselves and posting attractive photos) (Ong et al., 2011). The first reason for narcissists' preference for microblogging is the reduced anonymity. Unlike traditional online communities in which people may not know each other, the identities of microbloggers in real life are generally known. This is because microblogging encourages users to present one's own self and to express one's own feelings, personal thoughts, and individual lifestyle in a nearly instantaneous fashion. The posts on an individual's microblog more or less reflect some cues about his/her identities in real life (such as residence, occupation, etc.). Furthermore, a microblog is an open platform where all the information on one's microblog is exposed to others. Thus, other people can easily detect the user's true identity in real life (even if one may not use his real name) by tracking the posts and replies on one's microblog as well as the posts on other people's microblogs. In a sense, it is the

lack of anonymity that encourages narcissists to show themselves off in microblogs among their peers; what the narcissist does can thus be known by others. If a microblog was the type of forum where people have difficulty in detecting each other's real identities, then it would not be so attractive to narcissists. Second, the social nature of microblogging is also an impetus for narcissists to use their microblogs. The existence of offline friends on a microblog provides an audience base from which the narcissists can seek out attention. According to the notion that people care about what they are familiar with, the posts of narcissists would not attract much attention if the "followers" on a microblog were strangers. Additionally, the fragmented nature of microblogging makes it convenient for narcissists. Because of the ubiquitous nature of microblogging, it is more attractive for people with busy lifestyles. People can log onto a microblog such as Weibo anytime and anywhere without spending a large amount of time. On the one hand, this characteristic of microblogging enables narcissists to update their information instantly. On the other hand, the possibility of these quick updates can result in narcissists using their microblog more frequently. In summary, the lack of anonymity and the asynchronous and ubiquitous nature of microblogging may impel narcissists to become heavy users of microblog.

With respect to the relationship between social anxiety and microblog use, our results are consistent with previous findings that those who are socially anxious show a high tendency towards using Internet tools (Caplan, 2007; Feaster, 2010), thereby supporting the social compensation perspective. This suggests that those who are nervous, shy, and/or worried around people in a social context are more likely to use a microblog for social interaction. However, there is one theoretical contribution that should be mentioned. Although the detectability of a microblog reduces anonymity, social anxiety still positively predicts the intensity of microblog use. This finding compromises the traditional argument that socially anxious individuals prefer CMC interaction due to the

anonymity of CMC. One possible explanation is that anonymity is not a factor that socially anxious individuals consider when engaging in online communication. In fact, the combination of reduced anonymity, the extension and/or expansion of offline friends into the cyber microblog world, and the ubiquitous nature of microblogging may actually motivate socially anxious individuals to feel less threatened and more comfortable to interact with others through their microblog. The fact that most microblog friends are friends one already knows further facilitates socially anxious individuals to embrace microblogging for interpersonal interaction despite its lack of anonymity.

### **Direct Effects of the Intensity of Microblog Use on Social Capital**

Past research has shown that Internet use exerts both positive and negative effects on social capital (Boyd, 2008; Quan-Haase & Wellman, 2004; Samuel & Brian, 2006). Drawing on the theory of uses and gratifications, such differences may be contingent upon different motivations in the use of the Internet. If the Internet is employed to interact with others, it may have a positive effect on social capital as compared to use purely for information seeking or for utilities. Past studies have argued that all types of Internet content are crucial to maintaining social or intimate relationships (Boyd, 2008), whether it be news, spam, self-promotion, pointless babble, conversational messages, pass-along value (as classified by Kelly (2009) who examined Twitter messages using content analysis), or information in Twitter used for social interaction, self-documentation, information sharing, and self-expression (as defined by Liu and Lee (2010)). All of this content may be related to the increase of social capital. Using this logic, our results can be explained as follows: if the main use of microblogs is to share information with others, which in turn helps users keep in touch with friends and manage their social relationships, then such sharing would benefit one's social capital.

Contrary to previous research which argued that social networking sites attract relationships with weak ties (Ellison, Steinfield, & Lampe, 2006), results in this study show that microblog use has more predictive power for bonding social capital than for bridging social capital (as indicated in the beta weights). The discrepancy may be explained as follows: although people have both strong and weak social networks on their microblogs, they interact more frequently with people with whom they have strong ties. Thus, they may gain more bonding social capital from their strong social networks. Most content on Sina Weibo is about people's daily lives. And in Chinese culture, which is generally more reserved and less open when compared to the West, such content may seem relatively private, the types of things most people do not want to share with strangers. If people interact frequently (that is, if they "follow" each other), then the update of one's microblog is presented on the other's microblog. For this reason, most users often refuse to add people they do not know in order to avoid the leak of personal information to strangers. Indeed, some users of Sina Weibo explicitly announce in their personal statement on their microblog something like "Don't add me if I don't know you. Even if added, I will delete you." Therefore, Chinese people are more likely to interact with their close friends on Weibo than with strangers. And the more they keep in contact via their microblog with people who they share strong ties with, the more they will obtain emotional support from them. Consequently, the intensity of microblog use exerts more predictive power with respect to bonding social capital.

### **Mediating Role of Microblog Use**

One interesting finding is that the intensity of microblog use also mediated between narcissism and social capital. For narcissists, microblogging is an alternative social tool to gain both bonding and bridging social capital. By interacting with new friends and close friends on a microblog, narcissists can gain both

bonding and bridging social capital. However, the mediation effect of a microblog between narcissism and social capital is relatively small in magnitude when compared with the mediation effect between social anxiety and social capital. Therefore, we can say that socially anxious individuals would be more dependent on microblogs to accumulate social capital than narcissists. Narcissists could have many alternatives to accumulate social capital, while socially anxious individuals likely have fewer options. One thing that should be mentioned is that the positive relation between narcissism and bonding social capital does not contradict the finding of Campbell and Foster (2002) in which narcissism was negatively linked to maintaining long-term relationships. The relationship between narcissism and bonding social capital should be considered with respect to FtF and CMC. It is difficult for narcissists to maintain long-term relationships through FtF social interaction because other people may get bored with narcissists over time. However, as mentioned in the previous section, narcissists can use some characteristics of CMC to make an ideal impression on those with whom they share a strong connection. In this sense, narcissism is positively related to bonding social capital. Therefore, narcissism still exerts predictive power on bonding social capital after controlling for the intensity of microblog use.

### **Suppression and Mediation Effect of the Intensity of Microblog Use**

Another interesting finding in the study is the suppression effect of microblog use on social anxiety. A suppressor variable refers to "a variable which increases the predictive validity of another variable (or set of variables) by its inclusion in a regression equation" (Tzelgov & Henik, 1991), where predictive validity is assessed by the magnitude of the regression coefficient. Thus, a suppression effect is indicated when the inclusion of a third variable leads to the increment in magnitude of the relationship between an IV and a DV. The extreme case

(which occurs in the present study) is that the inclusion of a third variable raises the magnitude of the relationship of IV and DV from an insignificant level to a significant level.

The reason for the occurrence of a suppression effect in our mediation model is that the direct and mediated effects of an independent variable on a dependent variable have opposite signs (Tzelgov & Henik, 1991). The more socially anxious individuals are, the more they will fear negative evaluations in social interaction and avoid interaction in social networks. This subsequently reduced the bonding social capital they may have gained from social networks. However, as explained earlier, the data in the study show that the more socially anxious people are, the more they will use a microblog. Furthermore, microblogging is positively related to bonding social capital. Thus, the direct effect of social anxiety on bonding social capital is negative while the indirect effect of social anxiety via microblog use is positive. Therefore, in step 1 of model 5 in which we did not statistically remove the effect of microblogging, the negative force of social anxiety and the positive counterforce of microblog use occur together and have a counteractive effect. These two opposed effects may cancel each other out, resulting in a total effect of social anxiety equal to zero (or not significantly differing from zero). Although this insignificant overall relationship failed to meet the first criterion of Barron and Kenny (1986), the mediation can still exist; this is referred to as inconsistent mediation (Judd & Kenny, 1981).

The suppression effect of microblogging provides practical implications. A microblog is an important place for socially anxious individuals to obtain bonding social capital. The result indicates that microblogging may reverse the negative effect of social anxiety on bonding social capital to an insignificant level and would thus effectively ameliorate the bad social outcomes for socially anxious people. However, there are still some shortcomings in the study. We only examined the effect of microblogging, which may have common explanatory variance with other online applications, especially those

such as SNS. Further comparison between different types of social platforms is needed.

As for social anxiety-bridging social capital, the result indicated that social anxiety, partialling demographics, is positively related to bridging social capital. After partialling the intensity of microblog use, the positive correlation becomes insignificant. Thus, this result indicates that the positive effect of social anxiety on bridging capital is fully mediated by the intensity of microblog use. The implication of this finding is as follows: we suggest that socially anxious people use microblogging to accumulate bridging social capital. Without this platform, it is difficult for such individuals to accumulate bridging social capital in typical offline social interactions. This can be explained by the hyperpersonal model. As one type of CMC technology, microblogging allows socially anxious people more time to deliberate and develop a good way of expressing oneself and interacting with others, thereby reducing the bad impression one might make on others in FtF due to a lack of social skills. Moreover, compared with SNS, microblogging involves much wider social networks than SNS does. Networks on SNS primarily involve acquaintances and friends, but microblogs encompass the networks on SNS and also include strangers with common interests. In this regard, a microblog is an excellent place to reach new friends. People suffer no social anxiety make friends in various contexts beyond just a microblog, but for those with social anxiety, a microblog may be the best way for them to reach friends with different backgrounds and accumulate bridging capital.

To explain the unexpected positive relationship (which was expected to be negative) between social anxiety and bridging capital, we turn to the logic of suppression. We speculate that there are some other factors that may help socially anxious people obtain bridging capital. If we further remove the effect of such factors, the direct effect of social anxiety on bridging capital would become negative as we originally expected. In other words, it is the forces of microblogging and other factors that reverse

the effect of social anxiety on bridging social capital from negative to positive. However, this speculation requires further examination.

## LIMITATION AND FURTHER RESEARCH

First, some methodological limitations exist in this study. Our data were gathered through a snowball sampling technique, which may have caused some bias in our results. But as our study population was comprised of those who frequently use microblogs, using an online survey was an efficient way to reach our target subjects. Further studies should include both microblog users and non-users in a random sample to explore the differences between them. Also, the cross-sectional data do not demonstrate the cause and effect relationship between psychological attributes and microblog use as well as the outcome variable. Future studies should employ longitudinal design or experimentation.

Second, the current study only explores the influence of the general intensity of microblog use on social capital. Our findings demonstrate the correlation between intensity of microblog use and two types of social capital. However, the relationship between the specific motivation of microblog use and social capital should be further examined to provide practical implications. Therefore, drawing on the theory of use and gratification, future studies should identify the gratification and use of microblogs and explore the causality between microblog use and social capital.

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