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**SECTION 1: DISABILITY & TRAUMA**  
Negative Emotions or Problem Context? Testing Explanations of the Pervasive Effect: SHUI SUI  
Relationship Between Autistic Traits and Boarding in a Non-Large-clinical Sample: Mediating Effect of Anxiety and Depression: WU XI, ZHICHAO HU, JIANGHONG WANG, AND YI ZHANG

**SECTION 2: EMPLOYMENT PSYCHOLOGY & MARKETING**  
Effects of Autonomy-supportive and Controlling Styles on Situational Self-Determined Motivation: Some Unexpected Results of the Commitment Procedure: CAMELE AMOSA, SOPHEE BRIOT, NICOLE GILLET, STEVEN CARLINA, AND LUCIE FINEZ  
Caring Representations at Work and the Moderating Role of Job Self-Efficacy: ANNA REIDER AND ÅSAR HERPIN  
Entrepreneurial Stressors as Predictors of Entrepreneurial Burnout: XUENAN WU, SHUANCHEN CANG, AND ROBERT D. HENRY  
Using Exit Surveys to Assess Counterproductive Work Behaviors: A Case Study: GABRIELA PIKEER AND SAUL FINEZ

**SECTION 3: MEASURES & STATISTICS**  
Validation of the Italian Translation of the Affective Neuroscience Personality Scale: LORENA PASCUELO, STEFANO BIBBERTI, ILANNA B. NADER, CRISTINA ZUCCHETTI, GIUSEPPE BUONO, AND ANDREA CLARICI  
Paranormal Beliefs of Latvian College Students: A Latvian Version of the Revised Paranormal Belief Scale: ZILJA HANNSON, ANDREAS HANSSON, AND KUUSI MANSOOR

**SECTION 4: MENTAL & PHYSICAL HEALTH**  
Using Koller’s Solution-Focused Pastoral Counseling for Bereaved Clients: The Process of Empowerment from Clients’ Perspectives: PETER JIN DEH PAN, F. LIANG-YE DING, SHAO-LING TANG, AND S. S. JENNY YUAN  
Examining Relationships Between Levels of Control, Locomotion, Subjective Wellbeing, and Preference for Online Social Interaction: YUEHUA YE AND LIN LIN  
Assessing Diagnostic Reasoning: Exploratory Measures of Perceived Self-change in Young Adults: STEVEN CHAN, HERBERT KRESS, AND ALDOUR WARE

**SECTION 5: RELATIONSHIPS & COMMUNICATIONS**  
Assessing Implicit Mate Preferences Among Chinese and Japanese Women by Providing Lure, Sex, or Money Cards: ZHENG JIN, KIMBERI SHOBURA, AND LIJUN HAN  
Revisiting the Dependent Negative Effects of Foreign Language on Anxious Probable Solving: TOSHIMOTO WAKABE, SHO HAYAMARU, AND ERIKO WATANABE  

**SECTION 6: SOCIOCULTURAL ISSUES IN PSYCHOLOGY**  
The Late Technique: Replication and Refinement in a Field Setting: MARIE MARCHAND, ROBERT-VINCENT JOUVE, AND NICOLAS GUEZEN

Effects of “Face” Consciousness on Status Consumption Among Chinese Consumers: Perceived Social Value as a Mediator: JIE LI, XUN-AI ZHANG, AND GONG SUN  
Influence of Culture on Tripartite Self-concept Development in Adolescence: A Comparison Between Han and Uighur Cultures: ZHENGA ABDURAKHMAN, MARIARA MAMAT, WU LIU, AND YANHENG WU  
Gender Differences in Chinese Adolescents’ Subjective Well-being: The Mediating Role of Self-efficacy: ZI-WEI MA, WEN-NAN ZENG, AND KAI-YIN YE  
Chinese Characteristic Religiosity: Comment on Jing (2014): RUIBA ZHOU, CHAO LIU, AND XIAOJIN MAI

Oldsters and Ngrams: Age Stereotypes Across Time: SUSAN E. MASON, CLARA V. KUNTZ, AND CELESTINE M. MCGILL

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EXAMINING RELATIONS BETWEEN LOCUS OF CONTROL, LONELINESS, SUBJECTIVE WELL-BEING, AND PREFERENCE FOR ONLINE SOCIAL INTERACTION¹,²

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Summary.—The unprecedented popularity of online communication has raised interests and concerns among the public as well as in scholarly circles. Online communications have pushed people farther away from one another. This study is a further examination of the effects of online communications on well-being, in particular: Locus of control, Loneliness, Subjective well-being, and Preference for online social interaction. Chinese undergraduate students (N=260; 84 men, 176 women; M age = 20.1 yr., SD = 1.2) were questioned about demographic information and use of social media as well as four previously validated questionnaires related to well-being. Most participants used QQ, a popular social networking program, as the major channel for online social interactions. Locus of control was positively related to Loneliness and Preference for online social interaction, but negatively related to Subjective well-being; Loneliness (positively) and Subjective well-being (negatively) were related to Preference for online social interaction; and Loneliness and Subjective well-being had a full mediating effect between the relationships of Locus of control and Preference for online social interaction. The findings of the study showed that more lonely, unhappy, and externally controlled students were more likely to be engaged in online social interaction. Improving students’ locus of control, loneliness, and happiness may help reduce problematic Internet use.

Social media is transforming the way people communicate (Norman, 2012). The most widely used social media or network tools for instant communication in China are QQ, WeChat, Micro-blogging, and Renren [China Internet Network Information Center (CINIC), 2014], similar to Skype, Twitter, and Facebook, with free web or mobile communication and interactions such as online chat, file transfer, and texting. According to Tencent Financial Reports of 2014, there were about 829 million QQ monthly activated users and 438 million Weixin and WeChat monthly activated users at the end of the second quarter of 2014. These social networking sites are heavily used by Chinese college students and have become an important part of their lives (Kong, Ran, & Song, 2010; CINIC, 2013). It is not clear if individuals are benefiting from extensive online social interactions (Ka-
A preference for online social interaction may facilitate problematic Internet use (Morahan-Martin & Schumacher, 2000; Caplan, 2005). Caplan (2003) found that loneliness and depression predicted a preference for online social interaction. Hollenbaugh and Ferris (2014) showed that personality factors are related to Facebook users’ self-disclosures. More research is needed to examine the relationships between people’s preference for online social network use and psychological health (Papacharissi & Rubin, 2000; Nithya & Julius, 2007).

Preference for Online Social Interaction, Problematic Internet Use, and Personality

Preference for online social interaction is defined as a “cognitive individual-difference construct characterized by beliefs that one is safer, more efficacious, more confident, and more comfortable with online interpersonal interactions and relationships than with traditional face-to-face social activities” (Caplan, 2003, p. 629). Prior studies have discussed various factors with positive relations to preference for online social interaction, including social anxiety (Caplan, 2007), loneliness (Caplan, 2003), and low self-esteem (Fioravanti, Dettore, & Casale, 2012), as well as negative associations such as emotional intelligence (intrapersonal $r = -0.52$ and interpersonal $r = -0.37$ emotional intelligence; Casale, Tella, & Fioravanti, 2013) and self-presentation skills (Caplan, 2005). Research has shown that preference for online social interaction, as a cognitive symptom, may facilitate problematic Internet use (Morahan-Martin & Schumacher, 2000; Caplan, 2005). Problematic Internet use is a multidimensional symptom comprising negative social, academic, or professional consequences (Caplan, 2002, 2003, 2005).

Based on the literature, Nadkarni and Hofmann (2012) suggested that social media use might be motivated by people’s need to belong and need for self-presentation, and that the need for self-presentation might be associated with neuroticism, narcissism, shyness, self-esteem, and self-worth. Seidman’s (2013) study further showed that the participants’ self-reported agreeableness and neuroticism were correlated with belonging-related behaviors and motivations, and their self-reported extraversion was associated with more frequent use of Facebook for communication. Since preference for online social interaction is a cognitive symptom of problematic Internet use (Caplan, 2005), and personality traits have been tested to be associated with problematic Internet use, certain personality traits may be related to preference for online social interaction.

Locus of control refers to the extent to which people believe that they can control events that affect them (Rotter, 1966). A person’s locus of control is conceptualized as either internal or external. Those who have higher internal locus of control tend to believe that they can control their lives while
those who have higher external locus of control tend to believe that their lives and decisions are controlled by factors beyond their influence. People with a more external locus of control are more likely to engage in problematic Internet use (Chak & Leung, 2004). The first hypothesis is based on earlier studies that higher introversion and external locus of control were significantly associated with use of social networking and more problematic Internet use, and also based on the close relationships between preference for online social interaction, problematic Internet use, and social network use:

_Hypothesis 1._ There will be a positive relationship between external locus of control and preference for online social interaction.

Loneliness is a complex and unpleasant emotional response to a feeling of isolation. Loneliness usually includes anxious feelings of isolation or a lack of connectedness to other people and can be felt even when surrounded by other people (Hawkley & Cacioppo, 2009). In addition to personality factors, some studies have shown that interest in online interaction may be related to psychosocial health such as loneliness and depression. Specifically, Caplan (2003) assessed whether those who were lonely and depressed among 386 undergraduates preferred social interaction or Internet use. Loneliness (UCLA Loneliness Scale), depression (Beck Depression Inventory–II), and preference for online social interaction (subscales of the Generalized Problematic Internet Use Scale: Perceived Social Benefit and Perceived Social Control) were measured. The latter subscales assess positive perceptions of Internet use and so plausibly measure preferences. The results showed that the loneliness ($\beta = 0.19$) and depression ($\beta = 0.31$) might lead to people’s preference for online social interaction. Results also showed that preference for online social interaction plays an important role in the development of problematic Internet use. Caplan’s (2005) subsequent study showed that those who scored lower on self-presentation skills scored higher on preference for online social interaction scale and preferred online social interactions to face-to-face communication ($\beta = -0.40$).

McKenna, Green, and Gleason (2002) reported that socially anxious and lonely people were more likely to feel that they could express their real selves on the Internet better than in face-to-face settings, so they were more likely to have online social interactions. In other words, extensive use of the Internet is likely to be associated with loneliness (Kraut, Kiesler, Boneva, Cummings, Helgeson, & Crawford, 2002). The causal direction of this relation is not clear. Hamburger and Artzi (2003) used two competence effect models to support the hypothesis that it was the loneliness of the women participants that led them to be attracted to the Internet, not the Internet use leading to the women’s loneliness. Their results showed that loneliness mediated the relation between participants’ neuroticism and the social use of the Internet.
Hypothesis 2. There will be a positive relationship between loneliness and preference for online social interaction.

Subjective well-being refers to people’s experience of their quality of life, and it includes both emotional reactions and cognitive judgments (Diener, 2011). Prior studies have examined the relationship between social network use and users’ mental health from a positive psychological perspective and have shown mixed results. Some studies reported a negative correlation between the social network use and subjective well-being (e.g., Kraut, Patterson, Lundmark, Kiesler, Mukopadhyay, & Scherlis, 1998; Kross, Verduyn, Demiralp, Park, Lee, Lin, et al., 2013), while others reported positive relationship (e.g., Kraut, et al., 2002; Valenzuela, Park, & Kee, 2009; Lee, Lee, & Kwon, 2011). Kross, et al. (2013) reported that over a 2-wk. period, the participants’ frequency of Facebook use was negatively correlated with their life satisfaction. Lee, et al. (2011) reported that the time spent using social media was not related to subjective well-being, but the amount of self-disclosure on the social network was positively related to subjective well-being.

Whether the Internet has a positive or negative social effect may depend on the quality of people’s online relationships and on what people give up to spend time online (Kraut, et al., 2002). Based on previous studies, it is safe to say that social network use and individuals’ subjective well-being are related to some extent. Subjective well-being is associated with health and positive psychological behavior (Diener, 2011), while preference for online social interaction tends to be associated with problematic Internet use.

Hypothesis 3. There will be a negative relationship between subjective well-being and preference for online social interaction.

Locus of control is also closely related to loneliness and subjective well-being (García, Ramírez, & Jariego, 2002; Fiori, et al., 2006). Hojat (1982) found externality in locus of control was positively correlated with loneliness (r = .30). According to Karatas and Tagay (2012), people with a more internal locus of control tended to report higher well-being or feeling happier than those with a more external locus of control (r = .26). Apaolaza, Hartmann, Medina, Barrutia, and Echebarria (2013) investigated the influence of the Spanish online social networking site Tuenti on psychological well-being among Spanish teenagers; structural equation modeling showed that socializing had a significant negative effect on loneliness (β = −0.24), and loneliness was negatively related to psychological well-being (β = −0.27). Combined with the previous results about the relationship between locus of control, loneliness, subjective well-being, and preference for online social interaction, the authors therefore hypothesized that:
Hypothesis 4. Loneliness and subjective well-being each will have a mediating effect on the relationship between locus of control and preference for online social interaction.

Method

Participants

A total of 260 undergraduate students were recruited for the study. The participants (84 men, 176 women) came from four different universities in China. The majors represented were the arts (n=195), sciences (n=40), and engineering (n=25). Among the participants, there were 167 freshmen, 74 sophomores, and 19 juniors; 142 lived in the countryside, and 118 lived in the city. The participants were 18 to 24 yr. old (M=20.1, SD=1.2).

Procedure

The participants were asked to complete the questionnaires in their classrooms or in the library. They were informed of the purpose of the study and informed that their participation was voluntary and anonymous.

Measures

Demographic information was collected including the participants’ age, sex, degree program, family income, and residency (from city or countryside due to the economic gap between the city and countryside in China). The participants were asked the following question: “Which social media or networking program(s) do you use most often in your daily life? Please check one program below. You can check multiple options if you use them equally often or include others that are not listed: Renren,
Micro-blogging, WeChat, QQ, Facebook, Twitter, TianYa, Mop, Other.” In addition, they were asked to complete the questionnaires on locus of control, loneliness, subjective well-being, and preference for online social interaction.

Locus of control.—Rotter’s (1966) scale was adopted to measure the undergraduate participants’ locus of control (Wang, Wang, & Ma, 1999). Rotter’s original internal-external Locus of Control Scale consisted of six fillers and 23 forced-choice pairs (e.g., sample pairs of the items: a. Many of the unhappy things in people’s lives are partly due to bad luck; b. People’s misfortunes result from the mistakes they make). Higher scores were indicative of externality, and lower scores were indicative of internality. Test-retest reliability of the scale obtained with a 1-mo. interval was .72, and the internal consistency coefficient was .70 (Rotter, 1966). In the present sample, the internal consistency coefficient was .71.

Campbell Index of Well-being.—The Campbell Index (1976), which included nine bipolar adjective items rated on a 7-point scale, was used to measure the participants’ subjective well-being (Wang, et al., 1999). For each item there was a rating scale with anchors 1: Painful and 7: Happy. The final score was equal to the average score of the first eight items plus the score of the last item with weight 1.1; possible scores range between 2.1 (Most unhappy) and 14.7 (Happiest)(Wang, et al., 1999). In the present sample, Cronbach’s α was .93.

UCLA Loneliness Scale.—The revised University of California Los Angeles (UCLA) Loneliness Scale (Russell, Peplau, & Cutrona, 1980) was used to measure the participants’ loneliness. The revised UCLA Scale contains 10 positive and 10 negative statements about an individual’s social relations (e.g., “There is no one I can turn to”). Scores are rated on a 4-point scale with anchors 1: Never and 5: Often. The final loneliness score was the average score of all 20 statements. In the present sample, Cronbach’s α was .90.

Preference for online social interaction (POSI).—This was measured with four items based on the concept and instrument developed by Caplan (2010). Participants rated their agreement with items on a scale with anchors 1: Strongly disagree and 5: Strongly agree. The scale was translated into Chinese by the authors. The Chinese translation of one of the items was modified, and another item added (Caplan’s original scale included three items). The statement “I prefer communicating with people online rather than face-to-face” was modified into two items, “Online social interaction is safer for me than face-to-face interaction” and “Online social interaction is more effective for me than face-to-face interaction” (translating from Chinese into English). This revised Chinese translation was more closely aligned to Caplan’s original instrument and intent. It better
highlighted the trait of the “cognitive symptom” of preference for online social interaction. Confirmatory factor analysis was conducted to test the structural validity of the scale. The results supported a one-factor model of this scale with fit indices $\chi^2/df=3.89$, goodness-of-fit index (GFI) = 0.99, incremental fit index (IFI) = 0.98, and normed fit index (NFI) = 0.97. In the present sample, Cronbach’s $\alpha$ was .80.

**RESULTS**

The most favored online social interaction tools of the Chinese students were assessed. Ninety-five percent (249, 95.8%) of the participants used the popular messaging program QQ. WeChat came second (186, 71.5%), followed by Micro-blogging (148, 56.9%), Renren network (118, 45.4%), and Facebook (6, 2.3%). Table 1 shows the means and standard deviations of the Chinese graduates’ scores on the Locus of control, Loneliness, Subjective well-being, and adapted POSI scales.

**TABLE 1**

DESCRIPTIVE STATISTICS AND CORRELATION MATRIX FOR LOCUS OF CONTROL, LONELINESS, SUBJECTIVE WELL-BEING, AND PREFERENCE FOR ONLINE SOCIAL INTERACTION (POSI) ($N=260$)

<table>
<thead>
<tr>
<th>Scale</th>
<th>M</th>
<th>SD</th>
<th>Min.</th>
<th>Max.</th>
<th>Correlation 1</th>
<th>Correlation 2</th>
<th>Correlation 3</th>
</tr>
</thead>
<tbody>
<tr>
<td>Locus of control</td>
<td>10.91</td>
<td>3.91</td>
<td>0</td>
<td>21</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Loneliness</td>
<td>2.01</td>
<td>0.52</td>
<td>1</td>
<td>3.50</td>
<td>.30†</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Subjective well-being</td>
<td>10.96</td>
<td>2.10</td>
<td>4.20</td>
<td>14.70</td>
<td>−.30†</td>
<td>−.34†</td>
<td></td>
</tr>
<tr>
<td>POSI</td>
<td>2.78</td>
<td>0.70</td>
<td>1</td>
<td>5</td>
<td>.12*</td>
<td>.20†</td>
<td>−.21†</td>
</tr>
</tbody>
</table>

*p<.05. †p<.01.

The correlation between these four variables is shown in Table 2. As expected, there were significant negative correlations between the POSI and Subjective well-being scales, and significant positive correlations between the Loneliness, Locus of control, and POSI scales. Additionally, there were negative relationships between Loneliness, Locus of control, and Subjective well-being scales, and a positive correlation between Loneliness and Locus of control scales. This means that there were positive relations among low well-being, loneliness, external locus of control, and the POSI scale.

Demographic differences are shown in Table 2. There was no statistically significant difference on scales scores between the students who lived in the cities and those who lived in the countryside, nor between the students who came from one-child families and those who had siblings. There was, however, a significant difference in the Loneliness between male and female students, and no significant difference on the other three
The male students scored higher on Loneliness than female students ($t_{258} = 5.66$, $p < .001$, Cohen’s $d = 0.79$). According to the results of Fisher’s least significant difference $t$ test (LSD-$t$), the scores of students majoring in the arts tended toward external Locus of control ($F_{2, 257} = 3.45$, $p < .05$, $\eta^2 = 0.03$), and they had significantly lower Subjective well-being scores ($F_{2, 257} = 6.09$, $p < .01$, $\eta^2 = 0.05$) as well as significantly higher POSI scores ($F_{2, 257} = 7.64$, $p < .001$, $\eta^2 = 0.06$) than did the engineering students.

Using hierarchical multiple regression, the mediating effects of the undergraduate students’ Subjective well-being and Loneliness on POSI scores were tested. Three conditions must be met for mediation (Baron & Kenny, 1986). The results showed that the Locus of control variable explained 9% ($R^2$) of the variation in Subjective well-being ($F_{1, 258} = 25.98$, $p < .001$, $\beta = -0.16$), 9% ($R^2$) of the variation in Loneliness ($F_{1, 258} = 25.80$, $p < .001$, $\beta = 0.04$), and 2% of the variation in POSI scores ($F_{1, 258} = 3.88$, $p < .05$, $\beta = 0.02$); Subjective well-being explained 5% ($R^2$) of the variation in POSI scores ($F_{1, 258} = 12.10$, $p < .01$, $\beta = -0.07$), and Loneliness explained 4% ($R^2$) of the variation in POSI scores ($F_{1, 258} = 11.19$, $p < .01$, $\beta = 0.27$). When paths $a$ and $b$ in Fig. 1 were controlled, the relation between the independent and dependent variables was no longer significant ($\beta = 0.01$, $p > .05$). The mediation effects are shown in Figure 2. This means that Loneliness and Subjective well-being had full mediating effects between Locus of control and POSI scores.

**DISCUSSION**

This study focused on the factors that might influence people’s preference for online interactions. In particular, the authors examined the role of variables. The male students scored higher on Loneliness than female students ($t_{258} = 5.66$, $p < .001$, Cohen’s $d = 0.79$). According to the results of Fisher’s least significant difference $t$ test (LSD-$t$), the scores of students majoring in the arts tended toward external Locus of control ($F_{2, 257} = 3.45$, $p < .05$, $\eta^2 = 0.03$), and they had significantly lower Subjective well-being scores ($F_{2, 257} = 6.09$, $p < .01$, $\eta^2 = 0.05$) as well as significantly higher POSI scores ($F_{2, 257} = 7.64$, $p < .001$, $\eta^2 = 0.06$) than did the engineering students.

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**DISCUSSION**

This study focused on the factors that might influence people’s preference for online interactions. In particular, the authors examined the role of
locus of control, loneliness, and subjective well-being on Chinese undergraduate students' POSI. The authors' hypotheses were mostly confirmed.

As proposed in Hypothesis 1, the authors found that there was a positive relationship between the external Locus of control and the POSI. That is, the students who had an external locus of control reported a higher frequency of conducting online social interactions compared to those with an internal locus of control. In addition, those with an external locus of control were more lonely and unhappy. These conclusions were similar to the study conducted by Hojat (1982) and Karatas and Tagay (2012).

As proposed in Hypothesis 2, the authors tested and supported the positive relationship between Loneliness and POSI. Those students who felt lonelier were more likely to prefer online social interactions. In addition, there was a negative relationship between subjective well-being and preference for online social interaction. Those who felt less happy were more likely to prefer online social interactions. Hypothesis 3 was supported. Hypothesis 4 also was supported. Loneliness and subjective well-being had a full mediating effect between the relationship of locus of control and preference for online social interaction. These conclusions were also similar to some previous studies. The positive relationship between loneliness and preference for online social interaction has been tested by many studies, including, for instance, Caplan’s research (2003). Some other research has tested the effect of personality on Internet use (Hamburger &
Artzi, 2000; Nithya & Julius, 2007). Yet, this study added to the literature by establishing the mediation effect of loneliness and subjective well-being between locus of control and preference for online social interactions.

The present study focused on the relationship between locus of control, loneliness, subjective well-being, and preference for online social interaction. In addition, it emphasized the cognitive aspect of preferences for online social interaction behaviors. The results of the study confirmed earlier studies by Caplan (2005) and Morahan-Martin and Schumacher (2000) that preference for online social interaction might facilitate problematic Internet use, but extended prior studies in showing connection between locus of control and preference for online social interaction.

The current study is limited in the following ways. The participants were from three universities of one province in China, and there were more female participants than male participants; as such, the results may not be generalizable to populations beyond university students or to people of other provinces in China or other countries. Future study should include participants from more diverse backgrounds and compare different population profiles. Additionally, this was an exploratory study to examine Chinese undergraduates’ preferences for online social interactions and used surveys for data collection. Other methods should be used to understand undergraduates’ online psychology and behaviors in greater depth. It will be meaningful to explore and construct cognitive-behavior models of people’s online social psychology in future studies. Specifically, future research could include evaluating 1) the possible cause and effect relationships between preference for online social interaction, locus of control, loneliness, and subjective well-being; 2) the relationships between preference for online social interaction and online social network behaviors; 3) comparative studies of different populations; and 4) effective designs of online social network systems to help people improve psychological health.

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