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Social connectedness as a pathway linking active social media use and mental health: A mixed-methods study of Chinese international students in the U.S.

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Abstract

Recent policy actions in several U.S. states have proposed or implemented restrictions on social media platforms such as WeChat. For Chinese international students who rely on these platforms to maintain relationships with family and friends in their home countries, such changes may threaten to cut their social connections and influence their well-being. Given this situation, this study examined the relationships among active social media use, social connectedness, psychological distress, and well-being among Chinese international students in U.S. higher education. We conducted an explanatory sequential mixed methods study with 105 survey responses and six interviews. Results indicated that female international students reported lower levels of anxiety and loneliness, as well as higher levels of social connectedness and positive emotions compared with male students. In accordance with social capital theory, the mediation analyses further showed that social connectedness mediated the relationship between active social media use and both lower psychological distress and higher well-being. Qualitative interviews further explained how social media acts as a bridge for meaningful relationships, as well as how social connectedness brings psychological comfort and helps overcome mental distress. The unique contribution is the empirical evidence of how social media restrictions can disrupt social connectedness and trigger negative emotions. These integrated findings highlight the central role of active social media use in shaping Chinese international students' social connectedness and mental health. Implications for tailored campus mental health support and digital communication policies are discussed.

Introduction

International students frequently experience elevated levels of psychological distress during their transition to life in a host country (Razgulin et al., 2023). Recent U.S. national data suggest that these challenges have intensified over the past decade, with the prevalence of anxiety, depression, and suicidal ideation among international students nearly doubling (Zhai et al., 2025). In addition to existing risk factors, policy changes in some U.S. regions have introduced new challenges. Specifically, restrictions on certain China-based social media platforms, including WeChat (Gallagher et al., 2020) and TikTok (McMahon & Fraser, 2025), have been implemented. Such restrictions may disproportionately affect the mental health of Chinese international students, cutting off their primary, if not the only channels for maintaining contact with family and friends at home. As Chinese international students constitute roughly one quarter of the total international student population in the U.S. (Institute of International Education, 2025), improving the mental health of Chinese international students is critical to the campus climate and the overall well-being of the student body.

Reduced access to culturally relevant communication platforms may disrupt social support networks and limit opportunities for help-seeking. Social relationships play a critical role in facilitating international students' adjustment to life in the host country. Qualitative research suggests that key members from East Asian international students' social networks can encourage help-seeking behaviors from counseling services and other support resources on campus (Liu et al., 2020). Peer relationships maintained online can also support social adjustment, enhance social capital, and alleviate acculturative stress (Li & Peng, 2019; Lin et al., 2012). As Social capital theory suggests (Coleman, 1988; Putnam, 2000), social networks provide emotional and informational resources essential for well-being. Therefore, it is likely that restricted social media channels may negatively impact Chinese international students' mental health.

Current empirical research on whether using social media increases or reduces the sense of feeling socially connected remains mixed. While some research highlights its potential to strengthen interpersonal relationships (Phua et al., 2017), some research links social media use with increased perceived isolation (Primack et al., 2017). These inconsistencies motivate us to investigate, through a mixed-methods approach, how social media engagement, or a lack thereof, may relate to social connectedness and mental health outcomes among Chinese international students in the U.S.

Literature review

Social media usage: Gender differences and Chinese international students

Based on different behavioral patterns, social media usage is often categorized into active and passive usage, with the former primarily involving the production of information and the latter its consumption (Verduyn et al., 2017). More specifically, active social media usage includes direct contact with others on social media platforms, such as chatting, sending photos, posting messages or pictures, and responding to others' posts. In contrast, passive social media usage mainly includes observing others' lives through posts. Past research has found that, in general, people tend to spend less time actively using social media to create information than passively consuming information (Verduyn et al., 2017).

Meanwhile, evidence worldwide suggests that gender plays a significant role in differentiating both the social media usage behaviors and types of social platforms that people use. For example, women in the European Union were found to actively use social media more than men across age groups (Park et al., 2023). In both Europe and the U.S., teenage girls report using image- or video-sharing based platforms such as Instagram more than teenage boys; while teenage boys report more frequently using opinion-sharing or game-streaming based platforms such as Reddit or Discord (Park et al., 2023; Vogels et al., 2022).

Chinese international students in American higher education institutions use social media differently from domestic students or international students from other backgrounds in terms of the choices of social media platforms and the motivations behind these choices. Most international students use social media mainly to keep in contact with family and friends, either to maintain connections at home or to integrate into the host society, while domestic students use social media as an information source and entertainment (Chen & Gu, 2024). Moreover, domestic students primarily use American-based platforms like Facebook and Instagram; international students tend to frequently utilize social network sites popular in their home countries, such as Kakaotalk for South Korean students and WeChat for Chinese students (Chen & Gu, 2024; Park et al., 2014). One of the reasons that may contribute to this difference was their unfamiliarity with the unique features of host country social media platforms, such as "tagging" on Instagram (Chen & Gu, 2024). Given the different social media patterns, it is critical to explore the relationship between Chinese international students' social media usage and mental health.

International students' mental health

The positive dimension of mental health is often conceptualized as subjective well-being, described comprehensively in the PERMA framework (Seligman, 2011), comprising five core elements: positive emotion (P), engagement (E), relationships (R), meaning (M), and accomplishment (A). *Positive emotions* include feelings such as happiness, joy, cheerfulness, and gratitude. *Engagement* refers to a status of being fully absorbed in the activity, and "losing track of time.". *Relationship* describes having positive social connections with others. *Meaning* concerns a sense of purpose, significance, and feeling that life is valuable, which is particularly relevant during adolescence and early adulthood (Damon et al., 2003; Hill et al., 2010). *Achievement* refers to perceived progress toward goals, a sense of achievement, and effectiveness. The five building blocks enhance and reinforce each other, collectively contributing to an overall well-being (Seligman, 2018).The negative dimension of mental health status is often measured by symptoms of psychological distress, including depression, anxiety, and stress (Lovibond & Lovibond, 1995). Besides these issues, loneliness has become an increasingly serious global mental health concern after the global pandemic (Ernst et al., 2022).

Compared to domestic students, international students generally report poorer mental health outcomes (Nguyen et al., 2019). The COVID-19 pandemic further exacerbated these challenges by increasing incidents of racism, hate crime, and xenophobia towards people of Asian descent (Fan et al., 2022; Tang et al., 2023; Xiong et al., 2022). Longitudinal evidence focusing on international university students from China similarly showed substantial increases in anxiety and major depression during the pandemic, while social support during the pandemic served as a protective factor against major depression (Ke et al., 2023). Consequently, international students have faced a worsening mental health landscape in the post-pandemic era (Jamshaid et al., 2023). This concern is particularly salient for Chinese international students, as a recent systematic review and meta-analysis found high levels of depression and anxiety among Chinese international students during COVID-19 (Ying et al., 2025). Compounding these risks, Asian international students are less likely to reach

out for help, making their mental health problems less visible to mental health practitioners and campus services (Kim & Lee, 2021; Xiong & Yang, 2021). Among Chinese international students specifically, help-seeking intentions are further shaped by culture- and language-related barriers, including self-stigma, face concerns, English proficiency, perceived language discrimination, emotional self-control, and concerns about treatment quality (Ji & Nagata, 2024; Ma et al., 2021).

Notably, prior research had divergent conclusions about the gender differences. For example, a study in Japan has found that female international students have higher risks of depression and psychological distress (Nguyen et al., 2019). A study in Lithuania found that female international students reported more anxiety symptoms, but did not differ in depression and wellbeing from male international students (Razgulin et al., 2023). A more recent 12-study meta-analysis focusing on acculturation stress of international students across different countries found that there is no significant gender differences (Alzukari & Wei, 2024). The inconsistencies of findings on gender motivated us to investigate its role in international students' well-being.

Active social media usage, mental health outcomes, and mediating factors

Recent research has suggested that actively using social media is associated with improved well-being (Stanculescu, 2020; Verduyn et al., 2017). Several explanations have been proposed for these positive relationships. For example, participating in discussions, sharing experiences, and receiving feedback on platforms like Instagram and Facebook can validate users' contributions, reinforcing their sense of self-worth and belongingness to the online community (Stanculescu, 2020). Active engagement on Facebook is also found to build a sense of belonging through shared experiences and reciprocal communication (Pit et al., 2022). Engagement on platforms like Instagram and Twitter has been positively associated with life satisfaction and perceptions of social support (Masciantonio et al., 2021). Taken together, active social media use appears to be associated with subjective well-being through a sense of belonging to the online community.

To better understand the mechanism linking active social media usage and mental health outcomes, it is important to consider the role of social connectedness. Social capital theory provides a useful lens for interpreting these relationships. According to Coleman (1988), social connections provide opportunities for information exchanges and collective problem-solving, the quality of which depends upon the structure of network structure, social norms, and mutual trust. Putnam (2000) further distinguished between bonding social capital (i.e. close relationships with family and friends) and bridging social capital (i.e., connections with more distant or diverse groups). Social media may strengthen bonding capital by maintaining close ties with family and friends abroad, while also facilitating bridging capital through peer and academic networks in the host country (Ellison et al., 2007). In addition, empirical studies have found that actively using social media to communicate with friends is associated with increased *bonding social capital* (Burke et al., 2010).

For international students, these patterns have important implications. Social connections are strong predictors of their improved well-being, lower transition stress, and reduced depression (Hendrickson et al., 2011; Nguyen et al., 2019). Social connectedness also serves as a buffer against the negative mental health effects of perceived discrimination for Chinese international students living in the US (Sun et al., 2021). Therefore, social connectedness represents a potential mediator between active social media usage and mental health outcomes among international students.

Research questions

RQ1. Are there gender differences among Chinese international students regarding their active social media usage, social connectedness, psychological distress, loneliness, and well-being?

H1: We hypothesize that female students tend to have higher levels of active social media usage, social connectedness, psychological distress, loneliness, and lower well-being levels than male students.

RQ2. To what extent does social connectedness mediate the relationship between Chinese international students' active social media usage and psychological distress and loneliness?

H2: We hypothesize that Chinese international students who are more frequently engaged in active private social media usage feel more socially connected to others, which in turn lower their levels of psychological distress and loneliness.

RQ3. To what extent does social connectedness mediate the relationship between Chinese international students' active social media usage and well-being outcomes?

H3: We hypothesize that Chinese international students who are more frequently engaged in active social media usage feel more socially connected to others, which in turn enhances their mental well-being.

RQ4: What themes emerge during the interviews with Chinese international students enrolled in public universities in Florida about social media, social connectedness, well-being, and mental health?

RQ5: How do qualitative results help explain the quantitative results?

Method

Research design

This study employed an explanatory sequential mixed methods design (Creswell & Plano Clark, 2018), in which an initial quantitative phase was followed by a qualitative phase in the hope that the qualitative findings would directly inform the explanation and deeper understanding of results from the quantitative study. In the quantitative phase, survey data was collected from Chinese international students (N=105) and analyzed with structural equation models to examine the extent to which active social media usage and social connectedness, may explain mental health outcomes; In the qualitative phase, semi-structured interviews were conducted with Chinese international students (N=6) who were not part of the 105 surveyed students. Transcripts were analyzed thematically to further explain the mechanism affecting mental health outcomes.

Ethical approval and informed consent

Before data collection, the research protocol was approved in 2023 by the Institutional Review Board of Johns Hopkins University (protocol HIRB00017338). All methods were carried out in accordance with relevant guidelines and regulations, and in accordance with the Declaration of Helsinki. Informed consent was obtained from all subjects prior to participation. All participants were aged 18 years or older.

Quantitative survey

Procedures

We disseminated a Qualtrics survey through a combination of convenience sampling and snowball sampling strategies. Recruitment announcements were posted through on-campus posters, social media posts, emails, word-of-mouth messages, and authors' personal network and social media student groups (i.e., Wechat, Instagram, and Facebook). There is currently no consensus regarding the appropriate sample size for structural equation modeling, although methodological studies have suggested that a minimum sample size of 100 may be acceptable (Wolf et al., 2013). A power analysis based on the largest structural regression equation was conducted using the pwr package (Champely, 2020), based on the assumption of a medium effect size (f^2 = .15), α = .05, power = .80. The recommended minimum sample size was determined to be 118 participants. The data were collected between July 2023 and April 2024. In total, responses from 139 participants who answered no less than 60% of the questions were recorded. Participants who had missing data for their country of origin (n = 18) and who identified as coming from India (n = 5), U.S. (n = 3), South Korea (n = 2), Bangladesh (n =

2), Canada (*n* = 1), Mongolia (*n* = 1), Singapore (*n* = 1) or Germany (*n* = 1) were also excluded from the analysis due to the focus on Chinese international students.

Participants

The final sample consisted of 105 Chinese international students. The majority of the participants were female (61.90%) and were pursuing a master's degree (67.62%). The average age of the participants was 25.34 years (*SD* = 4.18, range = 18~48). Participants had been staying in the US for about 42.60 months on average (*SD* = 39.30, range = 0~156), which amounted to about three and a half years. The average of parental educational years was 14.50 years for mothers and 14.68 years for fathers, which amounted to a little over 2 years of college. On a 1–9 scale (1 = *lowest*, 9 = *highest*), the sample's mean socioeconomic status (SES) was 5.47 (*SD* = 1.69). Table 1 presented the descriptive statistics for these sociodemographic characteristics.

Measures

Two independent variables: Active messaging social media usage and Active posting social media usage

Active social media usage was assessed using two items adapted from the Multidimensional Scale of Facebook Use (Frison & Eggermont, 2020). Participants reported the frequency of their social media activities on a 7-point Likert scale (0 = *never to* 6 = *a day or more*). Active messaging social media usage, representing private interpersonal communication on social media, was measured by a single item: "How often do you send a private message, picture, video, or chat on social media?" Active posting social media usage, representing public content sharing on social media, was measured with a single item: "How often do you post a picture or a video from your life?"

Mediator: Social connectedness

Social Connectedness, as the mediator, was measured by the UBC State Social Connection Scale (UBC-SSCS; Lok & Dunn, 2023). This 7-item Likert scale (0 = *strongly disagree* to 7 = *strongly agree*) assesses feelings of social connection by asking participants to rate their perceived agreement with statements that describe their feelings. Two items: "I felt distant from people." and "I felt like an outsider" were reverse-coded (0 = *strongly agree* to 7 = *strongly disagree*). We used mean scores of the 7 items in the following analysis (Cronbach's alpha = .92).

Psychological distress model dependent variable: Psychological distress

Psychological distress was measured by the Depression, Anxiety, and Stress Scale-21 (DASS21), a 4-point scale (0 = *did not apply to me at all* to 3 = *applied to very much or most of the time*) that measures an individual's depression, anxiety, and stress level with three seven-item sub-scales (Lovibond & Lovibond, 1995). All three subscales demonstrate good internal consistency (Cronbach's alpha = .89 for depression; .67 for anxiety; .72 for stress; .88 for overall DASS21).

Psychological distress model dependent variable: Loneliness

Loneliness was measured by a short form of the 20-item UCLA Loneliness Scale (Russell et al., 1980). The three items were selected based on past research (Hughes et al., 2004) and contextual reasons. This short form contains three items assessing the frequencies of feeling different aspects of loneliness. The items were (a) In general, how often do you feel left out? (b) In general, how often do you feel like you have no one to talk to? and (c) How often do you feel being ignored? Participants rated their loneliness on a 5-point Likert scale with values ranging from "almost never" to almost all the time". The Cronbach's alpha is .83.

Well-being model dependent variable: Well-being

The well-being outcome was measured by the PERMA (Positive emotions, Engagement, Relationship, Meaning, and Accomplishment) scale that includes five subscales of well-being dimensions (Seligman, 2011). Each subscale contains

three items, scaled on a 5-point Likert scale (1 = *almost never/not at all* to 5 = *almost all the time/a tremendous amount*). Internal consistency was good (Cronbach's alpha = .70~.80). The relationship subscale was not included because the same subconstruct was measured through the social connectedness scale.

Covariates

The socio-demographic covariates for this study include participants' age, gender (male, female, other or prefer not to answer), educational level (undergraduate, master's, PhD, post-doc), months of living in the U.S., mother's education years, father's education years, and SES.

Data analysis

The present study performed data processing and preliminary analysis by using R statistical software version 4.5.2. The kurtosis and the skewness of key outcome variables are within the threshold for acceptable normality (± 2.0 for skewness and ± 7.0 for kurtosis, West et al., 1995). All scale measures demonstrated good internal consistency (Cronbach's alphas > 0.70; Tavakol & Dennick, 2011). Pairwise Pearson correlations were conducted to examine the associations among the study variables, and one-way ANOVAs were used to answer the first research question. We set the significance threshold at $p = .05$.

Structural equation modeling (SEM) was used to answer the second and third research questions. To assess model fit, the following criteria were adopted: (1) non-significant p-value of $\chi 2$ is expected (Tschannen-Moran et al., 2013); (2) a comparative fit index (CFI) and a Tucker Lewis index (TLI) both greater than .90 indicating good fit (Browne & Cudeck, 1992); (3) a root-mean-square error of approximation (RMSEA) less than .05 as close fit and RMSEA < .08 as acceptable in small samples (Browne & Cudeck, 1992); (4) a standardized root mean square residual (SRMR) less than .08 (Marsh et al., 2004). Indirect associations were tested using 5000 bootstrapped samples (Kline, 2016). Missing data were handled by full information maximum likelihood (FIML) estimation to preserve all valid data points in the sample (Acock, 2005). Although our sample size was modest ($n = 105$), the very low level of missing data and the relatively simple, observed-variable path model support adequate statistical power and estimation accuracy (Wolf et al., 2013).

We build two models: 1) the psychological distress model includes depression, anxiety, stress, and loneliness, and 2) the well-being model includes positive emotions, engagement, meaning, and accomplishment. For both models, we specified structural equation models to examine whether social connectedness mediates the association between active social media usage and outcomes of interest, while adjusting for demographic covariates. Residual covariances among the symptom outcomes were freely estimated to capture shared variance.

Qualitative interviews

Rationale and participant selection

We used purposeful sampling to identify information-rich cases for examining the mechanisms underlying our quantitative model. In the US, Florida was actively enforcing restrictions on WeChat, TikTok, and Tencent QQ across campus networks, a policy that severely influences Chinese international students (Florida Board of Governors, 2023). We therefore intentionally interviewed Chinese international students enrolled at a public university in Florida to understand these students' social media usage and how the usage and restrictions influence their well-being and mental health.

Six students from public universities in Florida participated in the interviews (4 female, 2 male; 5 PhD students, 1 undergraduate). Their average age was 25.16 years, and they had spent an average of 3.16 years in the U.S. The demographic characteristics of the sample are detailed in Table 2.

Data collection

Six semi-structured, in-depth interviews were conducted by the first author and two graduate research assistants via Zoom between March and April 2024. Each interview lasted approximately 40 to 80 minutes. Based on the study's specific aim, homogeneous sample, and rich data depth, a sample size of six participants yielded sufficient information power for robust thematic analysis (Malterud et al., 2016). An interview protocol (supplementary materials) was developed to guide the conversation, focusing on students' social media habits, their experiences maintaining relationships, the role of social support in their well-being, and their specific reactions to and coping strategies for the campus social media ban. While the primary language of the interviews was English, participants were encouraged to use Mandarin to express complex ideas if needed or if they felt that their English proficiency was insufficient. All audio recordings were later transcribed automatically by Zoom, manually checked and translated by a bilingual member of the research team. This language switch was possible because all interviewers are bilingual in English and Mandarin. All interviews were audio-recorded with participant consent and transcribed verbatim for analysis.

Qualitative data analysis

The interview transcripts were analyzed using a reflexive thematic analysis approach (Braun & Clarke, 2006). To establish the trustworthiness of the analysis, we drew on strategies recommended for rigorous qualitative research (Nowell et al., 2017; Braun & Clarke, 2024). Both coding researchers first engaged in extensive immersion in the data, reading and re-reading the transcripts to become thoroughly familiar with participants' accounts before formal coding. In the initial coding, two researchers (QZ and JW) commented on the transcripts with suggested descriptive codes for relevant segments of the text. Next, the whole research team collated codes into potential overarching themes that capture patterns in the data. The authors held regular meetings throughout the analysis process to discuss coding discrepancies and collaboratively refine the thematic structure, ensuring the final themes were a robust and credible representation of the participants' experiences. Throughout the process, we documented analytic memos and the evolution of the theme structure, and we engaged in ongoing reflexive discussion of the researchers' positionality, including our backgrounds as current or past Chinese international students living in the US, to examine how our own perspectives shaped data interpretation (Braun & Clarke, 2024; Nowell et al., 2017). Table 2 presents the profile of Chinese international students in the qualitative interview sample.

Integration of Methods

The integration of the quantitative and qualitative data occurred primarily during the final interpretation and discussion stages of the research (Fetters et al., 2013). The path model from the quantitative phase provided the statistical "skeleton" of our findings, identifying a significant pathway from social media use to well-being via social connectedness. The themes from the qualitative phase provided the narrative "flesh," serving to explain, illustrate, and enrich this model. Specifically, the qualitative data illuminated how social media facilitates social support (the mechanism of mediation) and demonstrated the profound consequences of disrupting this pathway, thereby providing a deeper, more holistic answer to our quantitative results.

Results

Participants reported WeChat (67.6%) as the platform they used most frequently, followed by Instagram (15.2%). Much smaller numbers named Xiaohongshu (Rednote, 3.8%) and Twitter/X (2.8%); while TikTok, Facebook, Discord, Weibo, Snapchat, Reddit, Tumblr, LinkedIn, Bilibili, and Douban were each mentioned in a few cases. Active messaging social media usage averaged 3.83 (SD = 1.96) on a scale of 0 to six, indicating a relatively modest level of active use with moderate variability across students, while active posting social media usage averaged 1.85 (SD = 1.13). In contrast, social connectedness averaged 4.83 (SD = 1.26) on a scale of 0 to 7, suggesting a moderately high sense of connectedness on its scale and similar dispersion. Psychological distress scores were generally low to moderate ($M_{\text{depression}}$ = 0.75, $SD_{\text{depression}}$ = 0.71; M_{anxiety} = 0.90, SD_{anxiety} = 0.61; M_{stress} = 1.10, SD_{stress} = 0.64; $M_{\text{loneliness}}$ = 2.31, $SD_{\text{loneliness}}$ = .91). Well-being scores were generally moderate to high ($M_{\text{positive emotions}}$ = 3.52, $SD_{\text{positive emotions}}$ = 0.74; $M_{\text{engagement}}$ = 3.43, $SD_{\text{engagement}}$ = 0.60;

$M_{meaning}$ = 3.53, $SD_{meaning}$ = 0.85; $M_{accomplishment}$ = 3.59, $SD_{accomplishment}$ = 0.64). Table 3 presents the descriptive statistics for key outcome variables.

Table 4 presents the correlation results. Active messaging social media usage showed a small positive correlation with connectedness (r = 0.22, p = .024) and was weakly associated with other outcomes (all p > .05). Unlike private social communication, active posting social media usage showed no significant association with social connectedness (p > .05) but was significantly associated with stress (r = 0.22, p = .028) and anxiety (r = 0.31, p = .002). Greater social connectedness showed robust associations with better well-being and lower psychological distress symptoms. Specifically, social connectedness correlated negatively with depression (r = -0.66, p < .001), anxiety (r = -0.35, p < .001), stress (r = -0.58, p < .001), and loneliness (r = -0.65, p < .001), and positively with positive emotions (r = 0.66, p < .001), engagement (r = 0.37, p < .001), meaning (r = 0.64, p < .001), and accomplishment (r = 0.54, p < .001).

RQ1. Are there gender differences among Chinese international students regarding their active social media usage, social connectedness, psychological distress, loneliness, and well-being?

As for categorical variables, Table 5 presents the ANOVA test of key outcome variables by Chinese international students' gender and educational level. H1 was not supported since the direction was opposite to prediction. Females reported higher connectedness (means 5.10 vs 4.43 vs 4.05; p = .018), lower anxiety (0.77 vs 1.07 vs 1.33; p = .030), and lower loneliness (2.09 vs 2.67 vs 3.00; p = .003) than both male students and other or prefer not to answer students. Females also reported higher positive emotions (3.69 vs 3.29 vs. 2.78; p = .005) than male students and others or prefer not to answer students. There were no significant gender differences in depression, stress, engagement, meaning, or accomplishment. Levene's tests indicated that the assumption of homogeneity of variance was generally met (all p > .05) except for active posting social media use across educational levels (p = .046). Educational level was not statistically significantly associated with any key variable.

RQ2. To what extent does social connectedness mediate the relationship between Chinese international students' active social media usage and psychological stress and loneliness?

The proposed model for psychological distress outcomes (Figure 1) fit the data well (χ^2 [14] = 20.829, p = 0.106; SRMR = 0.044; RMSEA = 0.068, 90% CI 0.000–0.130, $p$close = 0.283; CFI = 0.975; TLI = 0.875). Equation-level R^2 indicated that the model explained 48.1% of variance in depression, 40.6% in stress, 24.4% in anxiety, 48.4% in loneliness, and 13.6% in connectedness.

Results from path analysis are consistent with our prespecified hypotheses. As shown in Figure 1 and Table 6, social connectedness was a robust predictor of lower symptom burden across domains. Standardized paths from connectedness to depression (β = -0.630, p < .001), stress (β = -0.559, p < .001), anxiety (β = -0.268, p = .008), and loneliness (β = -0.584, p < .001) were all significant. Active messaging social media usage was positively associated with connectedness (β = 0.207, p = .030), but it showed no significant direct associations with any symptom outcome (all $p \geq .1$). Active posting social media usage was not associated with connectedness (β = -0.004, p = .968), but it was directly and significantly associated with anxiety (β = 0.278, p = .011). It also showed positive direct associations with depression (β = 0.145, p = .082), stress (β = 0.165, p = .080), and loneliness (β = 0.140, p = .059), although these effects did not reach conventional levels of statistical significance. Among covariates, higher SES was marginally associated with lower stress (β = -0.168, p = .051).

Active messaging social media usage exhibited significant indirect associations with lower depression (β = -0.131, p = .021, 95% CI [-0.085, -0.005]), stress (β = -0.116, p = .028, 95% CI [-0.071, -0.004]), and loneliness (β = -0.121, p = .041, 95% CI [-0.113, -0.005]) through increased connectedness. The indirect path to anxiety trended negative but was not significant (β = -0.055, p = .094, 95% CI [-0.039, 0.001]). No significant indirect associations were found between active public social media usage and any of the symptom outcomes.

RQ3. To what extent does social connectedness mediate the relationship between Chinese international students' active social media usage and well-being outcomes?

Figure 2 presents the second model with well-being as key outcomes of interest. The well-being SEM demonstrated excellent fit (χ^2 [14] = 22.432, p = 0.070; SRMR = 0.044; RMSEA = 0.076, 90% CI 0.000–0.132, $p$close = 0.215; CFI = 0.964; TLI = 0.822). Equation-level R^2 indicated that the model explained 44.1% of variance in positive emotions, 20.2% in engagement, 44.0% in meaning, 36.1% in accomplishment, and 13.6% in connectedness.

Social connectedness was a robust predictor across all well-being outcomes: higher connectedness was associated with greater positive emotions (β = 0.631, p < .001), engagement (β = 0.318, p = .002), meaning (β = 0.588, p < .001), and accomplishment (β = 0.460, p < .001). Active messaging social media usage was positively associated with connectedness (β = 0.206, p = .029) but did not show significant direct associations with any well-being outcome (all $p \geq .1$). Active posting social media usage was not significantly related to connectedness (β < 0.001, p = .999) or any of the well-being outcomes (all ps > .05). Table 7 presents the path analysis results.

Consistent with the structural paths, active messaging social media usage exhibited significant indirect associations with higher well-being via connectedness: positive emotions (β = 0.130, p = .025, 95% CI [0.004, 0.091]) and meaning (β = 0.121, p = .034, 95% CI [0.005, 0.100]), as well as a borderline effect for engagement (β = 0.066, p = .075, 95% CI [0.001, 0.045]) and accomplishment (β = 0.095, p = .054, 95% CI [0.002, 0.065]). Active posting social media usage did not exhibit significant indirect associations with any of the well-being outcomes.

RQ4: What themes emerge during the interviews with Chinese international students enrolled in public universities in Florida about social media, social connectedness, well-being, and mental health?

Four key themes emerged through the reflexive thematic coding process of the interview transcripts.

Theme 1. Social media as a bridge for meaningful and enduring relationships

Participants consistently perceived social media platforms, such as WeChat and TikTok, as more than tools for communication or entertainment; rather, they regarded them as important channels for maintaining meaningful interpersonal relationships. For our participants who lived abroad and geographically separated from their family members and long-term friends, social media enabled them to stay connected, share everyday experiences, and remain involved in each other's lives. The following quotes demonstrate how home country social media channels help Chinese international students sustain important relationships despite physical distance:

"For QQ and WeChat... it really brings me and my friends back in my high school or middle school years together. Sometimes... I thought we are going to lost contact, but since we have QQ and WeChat, we can chat every day." [Alex, First-year PhD student]

"WeChat is the biggest and most commonly used among Chinese individuals and families. It's the most commonly used one we connect with our family far away from us." [Sarah, Senior undergraduate student]

Beyond facilitating communication, participants emphasized that the value of social media extended to fostering emotional attachment and a sense of belonging through the continuity of meaningful relationships. Rather than simply reducing homesickness, they described how ongoing interactions via social media strengthened their emotional investment in family and friends and deepened their appreciation of the relationships. Several participants highlighted that maintaining meaningful relationships through social media became an important source of social connectedness in the absence of regular face-to-face interactions. For example, Jing, a Third-year PhD student, shared

"Sometimes it's not about homesick, it's more about maintain the relationship, the attachment... I think what's more important is like if you feel you have a sense of belongingness... talking and interacting with them on WeChat. That is a different sense of belongingness, compared to other social media such as Instagram, WhatsApp, or Facebook."

Theme 2. Experiencing positive emotions and psychological comfort through social connectedness

Theme 2 further illustrated the positive psychological experiences associated with sustained social connectedness. Several participants described that communication with family and friends enabled them to feel accompanied and supported, which helped alleviate feelings of loneliness and fostered psychological comfort and positive emotions. The emotional support derived from these social connections allowed participants to feel more emotionally positive while adapting to life overseas as demonstrated in the following quotes.

"When I go to the University Hall or some places... I would see some beautiful campus view or something like that. And I would really want to show it with my friends and all my families. So when I'm doing this, I would feel that they are with me, they are not out of my life. I am not alone, things like that. I would feel better if I can use those social media on campus." [Wang, First-year PhD student]

"I would say positive, a lot of positive and warm emotions. Like happy, you know, happy to use it and then feel very familiar with it. You are more inclusive when using it." [Alex, First-year PhD student]

In addition to emotional support from significant others, participants also mentioned that staying in touch with Chinese friends and communicating in their native language enabled them to maintain a connection to their cultural roots. This sense of cultural familiarity and belonging further fostered positive psychological experiences.

"Sometimes, I can spend my spare time (with) Chinese friends. I have a feeling that, oh, I still use Chinese and I'm speaking Chinese (with friends), and I still can write it (with WeChat). I feel that's all, I'm still in this cultural circle." As Arian, a first-year PhD student, stated.

Theme 3. Coping with mental distress through social connectedness

Furthermore, sustained social connectedness helped our participants cope with the emotional challenges associated with studying abroad. Family members and friends were consistently described as major sources of support when students experienced loneliness, homesickness, and the stress of adapting to a new environment. Their companionship and emotional support helped alleviate feelings of isolation and provided emotional comfort during difficult times like the following quotes stated.

"It makes me feel like belonging. It doesn't make me feel like I'm alone because I have a community, I have family who's with me... But when you keep in touch and keep posted, just focus on what's going on, like around people who are far away from you but still who care about you, like your friends and your family. It makes you feel better and doesn't feel like you are alone." [Sarah, Senior undergraduate student]

"I think it's (WeChat) reducing my homesickness, you know, since I use it as a way to connect to my family so I wouldn't feel lonely here." [Wang, First-year PhD student]

Encouragement and care from family members and friends also served as valuable sources of emotional support when participants experienced anxiety or other negative emotions. Thoughtful messages and words of encouragement not only reassured them that they were not facing these challenges alone but also strengthened their confidence and sense of security in navigating life abroad. As one participant shared:

"If my friends like encourage me by leaving me a comment like 'I will be on your side' when I feel anxious. When I feel bad, they will leave a comment... I still feel encouraged and still feel beloved." [Sarah, Senior undergraduate student]

Theme 4. Disrupted social connectedness following social media restrictions

Although participants generally perceived social media as beneficial for maintaining relationships and supporting their mental well-being, several students described an opposite and negative experience following the implementation of

Florida's social media restrictions. Rather than emphasizing the absence of the social media platform itself (*WeChat*), students highlighted that the restrictions interrupted their connections with family members and friends, leading to frustration, isolation, and psychological discomfort. One student shared:

" Sometimes I would feel annoyed. Or... just in a bad mood because things on WeChat doesn't work... I remember once my phone number didn't work so I could not use to call anybody else, all I have is WeChat but it is not working on campus... it's just that you lose connection to everyone, and this will make you feel kind of panic." [Wang, First-year PhD student]

Being unable to communicate with significant others broke their usual patterns of interaction and created feelings of disconnection. Participants described feeling anxious or even panicked when communication with their social networks was unexpectedly interrupted, suggesting that it was the disruption of social connectedness which negatively affected their mental well-being. Both Alex and Arian shared the concerns,

" I cannot call my parents when I was on campus in the morning. I cannot... send pictures with the Wi-Fi here... it's really negative on my life." [Alex, First-year PhD student]

" If I can only use other social media, without the WeChat, yes, in this time, I can be stressed." [Arian, First-year PhD student]

RQ5: Connecting the qualitative and quantitative results

Taken together, the four themes provide a coherent answer to RQ5. In each theme, social connectedness is the central mechanism: the sense of connection, belonging, and support that social media use enables relational and emotional benefits. Theme 4 reinforced this pattern from the opposite direction: when Florida's restrictions disrupted students' habitual contact with their networks, the resulting loss of connectedness produced frustration, isolation, and distress.

The qualitative accounts further explained the quantitative results, in which social connectedness mediated the associations between active social media use and both psychological distress and well-being. Where the structural models showed that connectedness statistically transmits the effect of social media use on mental health, the interviews clarify the experiential basis of that pathway: students describe connectedness as the very reason social media matters for how they feel.

Discussion

In keeping with the explanatory sequential mixed-methods design, we first discuss the quantitative findings, then the qualitative findings, and finally integrate the two strands into a fuller account of how social media use relates to the mental health of this population. Across both strands, social connectedness consistently emerged as the central mechanism, underscoring its role in the college experience of Chinese international students.

Discussing the quantitative findings

The quantitative analyses produced three sets of findings, concerning gender differences in mental health, the mediating role of social connectedness in psychological distress, and its mediating role in well-being.

Female students report better mental health outcomes

Gender differences were notable: female students reported stronger connectedness, lower anxiety, lower loneliness, and greater positive emotions compared to males. These findings resonate with prior research documenting gendered patterns in distress and coping, with women more likely to rely on relational support and men more likely to report higher psychological burden (Ramón-Arbués et al., 2020; Viertiö et al., 2021). Second, no significant differences were observed by

educational level, suggesting that the processes linking connectedness to mental health might cut across undergraduate and graduate student populations.

It is worth noting that similar past studies did not foreground gender as an analytic focus (e.g., Duan et al., 2025; Xia & Liu, 2023). Our gender findings therefore address a relatively unexamined question within this specific body of work rather than confirming an established consensus.

Social connectedness mediates pathway from active social media usage to psychological distress

Social connectedness emerged as a robust mediator. Higher connectedness was consistently associated with lower depression, anxiety, stress, and loneliness. These results align with a growing body of literature identifying social connection as a key buffer against distress during times of adversity, including the COVID-19 pandemic (Tang et al., 2023; Zhang et al., 2023). Furthermore, this convergence agrees with quantitative work in which bonding social capital mediated the association between WeChat use intensity and lower loneliness among Chinese college students (Xia & Liu, 2023), and with evidence that social media use predicts subjective well-being primarily through social capital among international students (Duan et al., 2025). The present study extends this prior work in two respects: it moves from domestic or China-based samples to Chinese international students in the US, and it broadens the mediator from a bonding-capital operationalization to a general measure of state social connectedness.

By contrast, active social media usage demonstrated only weak direct associations with outcomes, and in some models was modestly associated with higher stress and anxiety. This pattern reflects prior reviews highlighting the mixed effects of social media use on well-being, depending on how it is used and whether it facilitates authentic relationships (Verduyn et al., 2017).

Importantly, our SEM revealed significant indirect effects: social media usage is indirectly related to lower depression, stress, and loneliness via stronger connectedness. In fact, for stress outcome, for example, if not for the buffer social connectedness provides, more active social media usage is associated with higher stress level. In other words, active social media usage is only mentally healthy if it helps international students with building social connections. This finding adds to the prior literature (e.g., Stanculescu, 2020) and provides additional explanations for the condition under which active social media usage can be beneficial.

These findings are consistent with Social capital theory. For Chinese international students, both forms of social capital appear critical for reducing distress. However, policy restrictions that limit access to culturally relevant platforms, such as WeChat, may undermine both bonding and bridging social capital, leaving students vulnerable to isolation and distress (Axelbank & Turner, 2023). This study therefore underscores the importance of viewing social media use not as inherently positive or negative, but as a mechanism for building social capital and connectedness.

Social connectedness mediates pathway from active social media usage to well-being

A parallel pattern emerged for well-being. Consistent with the PERMA framework (Seligman, 2018), social connectedness was strongly associated with positive emotions, engagement, meaning, and accomplishment. These findings echo prior evidence that social ties are foundational to flourishing among young adults and serve as building blocks for well-being (Ramón-Arbués et al., 2020).

Direct associations between active social media usage and well-being outcomes were minimal. However, indirect effects through connectedness were significant: greater active use predicted higher positive emotions, meaning, and accomplishment when mediated by stronger connectedness. These indirect-effect findings agree with Duan et al. (2025), who reported that social capital mediated the link between social media use and subjective well-being among international students. The present study replicates this mediational logic while extending it to a distinct, multidimensional well-being framework (PERMA) and a U.S.-based Chinese international sample. Moreover, they highlight the potential for social media

to serve as a supportive tool when it facilitates authentic interpersonal ties, while cautioning against overreliance on activity metrics alone as indicators of well-being (Verduyn et al., 2017).

Discussing the qualitative findings

The qualitative interviews were designed to explain the quantitative patterns in greater depth. Four themes together illuminate how and why social connectedness carries the effects observed in the survey data. Similar to previous qualitative interviews (Xie & Chao, 2022), the first three themes are consistent with qualitative evidence that Asian international students use social media to preserve transnational ties and to compensate for social support diminished by migration.

The unique contribution in this qualitative interview is related to Chinese international students' loss of WeChat/TikTok access in Florida and our Florida-recruited interview sample. This paper is among the first empirical studies to address this policy impact directly. To our knowledge no prior peer-reviewed empirical study has examined how U.S. state-level platform restrictions affect Chinese international students' social connectedness and mental health. Existing scholarship establishes WeChat's centrality to these students' support networks (Xia & Liu, 2023; Xie & Chao, 2022), and policy commentary anticipated the disruption a ban could cause (Duan & Wong, 2020), but the lived impact had not been studied empirically.

In particular, the qualitative Theme 4 (e.g., disrupted social connectedness following social media restrictions) revealed that several participants described distress following Florida's restrictions on social media platforms. Tellingly, students emphasized not the absence of a particular platform but the disruption of their usual patterns of interaction with significant others. Being suddenly unable to communicate produced feelings of disconnection, and some reported anxiety or even panic. This suggests that it was the interruption of connectedness, rather than reduced platform access itself, that undermined their well-being. Such panic and anxiety makes sense because Chinese international students depend exclusively on WeChat to communicate with their families and friends back in China because China has banned almost all foreign social media networks (Lu, 2020). A ban on WeChat means removal of their entire contact lists and online social communities that no other channel could potentially replace. This theme provides first-hand empirical evidence for a disruption that had previously been described only in journalistic accounts (Duan & Wong, 2020), highlighting the potential harms that were caused by the policy.

Discussing the relationship between the quantitative and qualitative findings

Bringing the two strands together yields a more complete account than either provides alone. The quantitative and qualitative findings converge on a single organizing mechanism: social connectedness. The survey data established that connectedness statistically mediates the relationships between active social media use and both distress and well-being, while the interviews explain why this pathway holds. Particularly, students experience social media primarily as a means of sustaining relationships, cultural belonging, and emotional support, which are the very ingredients of connectedness.

This integration also helps interpret one of the more puzzling quantitative results: the weak, and occasionally adverse, direct associations between active social media use and mental health, alongside consistently significant indirect effects. Because students valued platforms for the relationships they enabled rather than for activity itself, the mental-health benefits of use depended on whether that use translated into felt connection. Usage without meaningful connection might not improve outcomes, which mirrors the quantitative finding that active use was associated with higher stress in the absence of connectedness. In mixed-methods terms, the qualitative strand expands and explains the quantitative mediation model by specifying the relational content that the survey captured only indirectly.

The fourth theme offers a particularly clear point of integration between the study's mechanism and its policy context. The quantitative models, framed through Social capital theory, imply that restricting culturally relevant platforms undermine the

connectedness on which students' mental health depends. The interviews render this implication concrete: students subject to Florida's restrictions reported distress arising specifically from disrupted connectedness rather than from platform loss per se. Read together, the two strands suggest that the risk posed by platform restrictions operates through the same connectedness mechanism: under ordinary conditions, protects students; when access is disrupted, the pathway that buffers distress is disrupted with it.

Policy and practice implications

The findings have several implications for college health professionals and campus leaders. Interventions aimed at supporting international students' mental health may need to prioritize strengthening social connectedness through initiatives such as peer mentorship programs, student organizations, and culturally inclusive campus activities (Xiong et al., 2022; Xiong et al., 2024). Outreach strategies may also benefit from accounting for gender differences in connectedness and psychological distress. In addition, culturally relevant communication channels, such as WeChat, may serve as effective tools for outreach, engagement, and mental health promotion among Chinese international students.

At a broader level, institutions may consider the potential structural consequences of policy restrictions on social media platforms that international students commonly use to maintain relationships across borders. Limited access to familiar digital communication spaces may disrupt social connections and increase the risk of loneliness or distress. Universities may help mitigate these challenges by providing alternative communication platforms and fostering offline spaces that support cultural community-building.

Limitations and future directions

Several limitations should be acknowledged. First, the cross-sectional design precludes causal inference. Longitudinal studies are needed to test the directionality of relationships between social media use, connectedness, and well-being. Second, all measures were self-reported, raising the possibility of reporting bias. Third, the study was conducted with a relatively small sample of Chinese international students (n = 105 for survey; n = 6 for interview) that the majority of whom were female. The sample size may have limited the statistical power to detect smaller effects, while the restricted sample characteristics may limit the generalizability of the findings to other student populations. In addition, on average, survey participants have lived in the US for about four years and might have developed local networks. Their experiences will be drastically different from Chinese international students who newly arrived in the US. Future studies could focus more on students with shorter length of stay in the US and examine platform-specific effects, explore structural factors such as policy restrictions, and investigate gendered coping mechanisms in more depth. Relatedly, because the restriction experiences reported here are specific to Florida's regulatory context, the findings may not generalize to students in states without comparable policies; comparative, multi-state research would help establish how far the connectedness-disruption mechanism observed here extends. Lastly, the qualitative transcripts may suffer from researcher biases and six interview participants might not be able to fully represent the quantitative sample.

Conclusion

This mixed-methods survey study underscores the important role of social media in shaping the mental health of Chinese international students. Specifically, active social media use, when it facilitates social connectedness, may contribute to higher levels of well-being while being associated with lower levels of psychological distress and loneliness. Gender differences also emerged, with female students reporting more favorable psychological outcomes than male students. In addition, the results highlight the broader significance of digital communication platforms in enabling international students to maintain social ties across borders. As debates around platform restrictions continue, it is important to consider how access to these communication channels may influence international students' ability to sustain social connectedness and support their well-being.

Declarations

Author Contribution

Q.Z., L.L.H. and Y.X. conceived and designed the study. Q.Z. conducted the investigation, and Q.Z. and J.W. curated the data. Q.Z. and Y.X. developed the methodology. Q.Z. and H.S. performed the formal analysis and prepared the figures. Q.Z. and L.L.H. wrote the main manuscript text. Y.X. supervised the study. All authors reviewed and edited the manuscript.

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Data Availability

The de-identified dataset generated and analysed during the current study is available in the github repository: https://github.com/qiyangzh/Social-connectedness-as-a-pathway-linking-active-social-media-use-and-mental-health . To protect participant anonymity, several variables were removed or coarsened prior to deposit.

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Tables

Tables 1 to 7 are available in the Supplementary Files section.

Figures

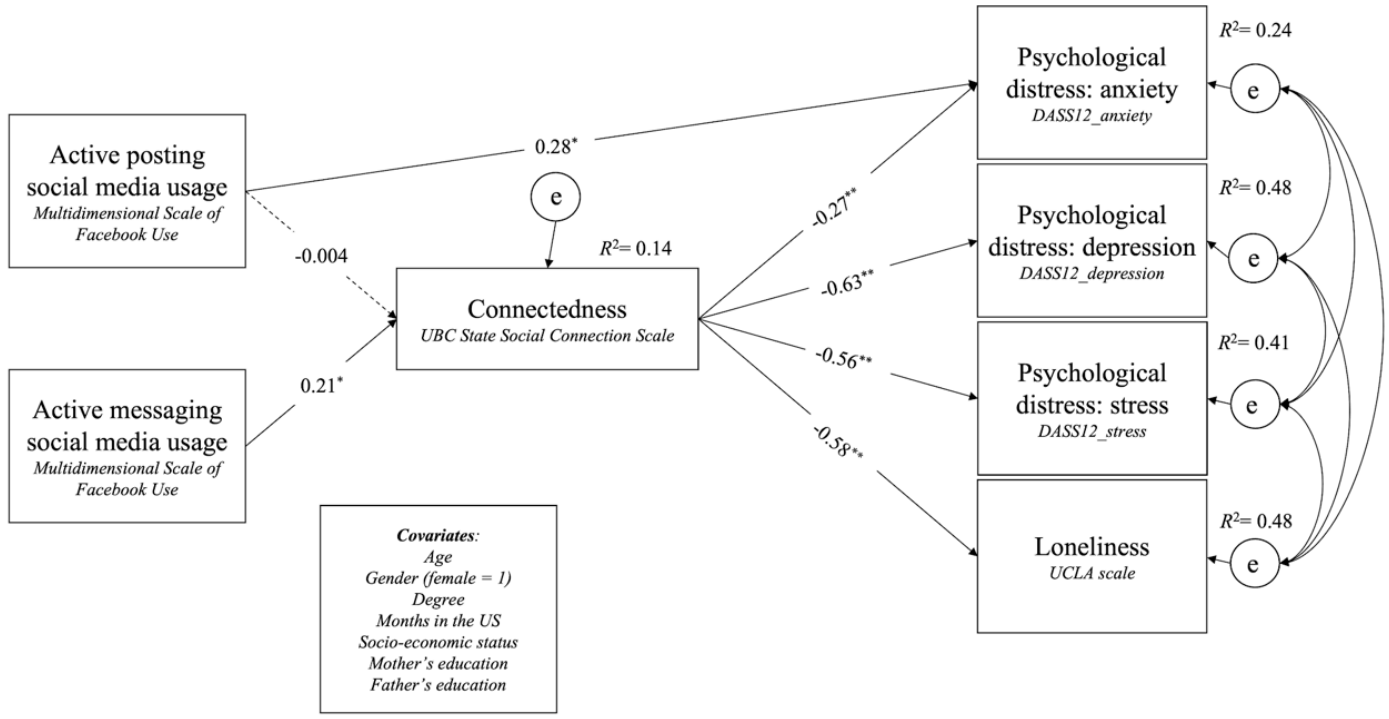


Figure 1

Path Analysis Model for Psychological Distress

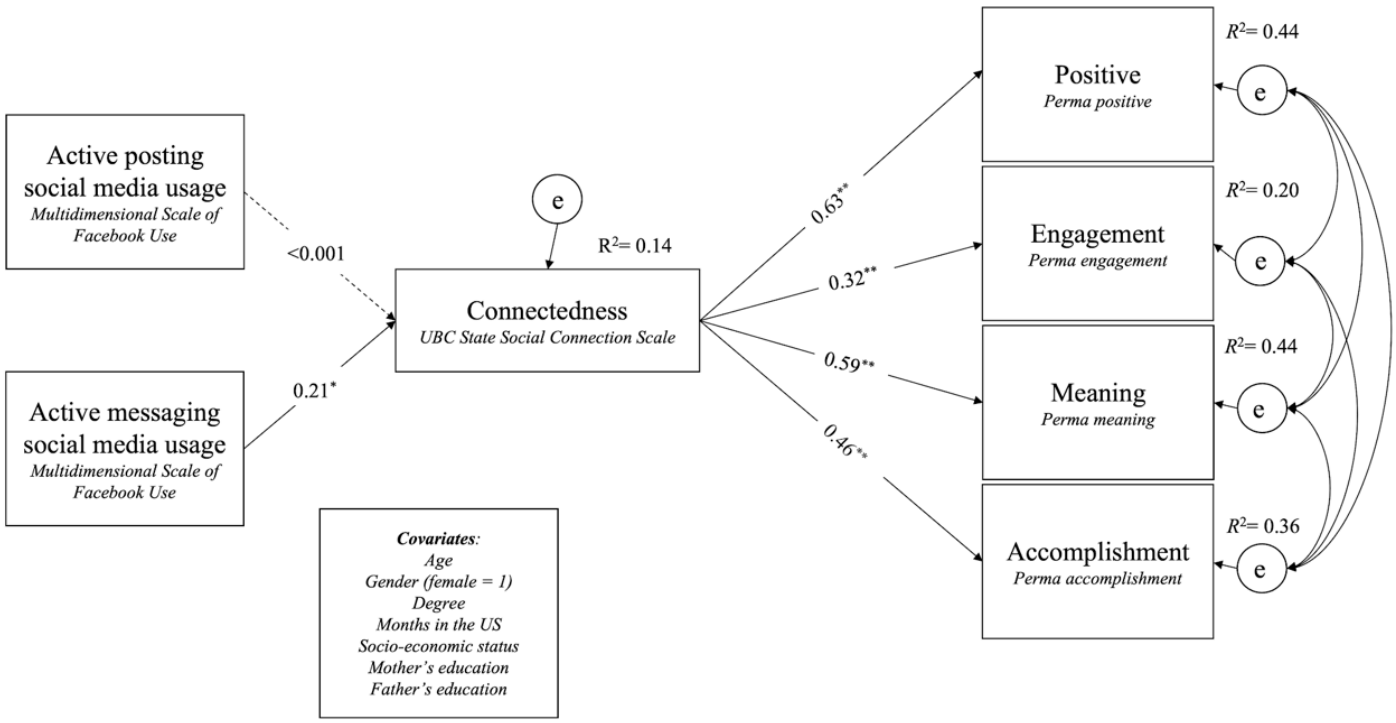


Figure 2

Supplementary Files

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