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Associations Between Internalizing Symptoms and Social Media Use
in Young Adults with Chronic Pain

A Senior Thesis Presented

by

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Associations Between Internalizing Symptoms and Social Media Use in Young Adults with Chronic Pain

Between 2005 and 2015, the number of Americans using social media has increased nearly ten-fold. Young adults comprise the largest online presence out of any age cohort, with most young adults reporting to have at least one social media profile (Perrin, 2015). With social media's growing popularity, it is important to understand the positive and negative functions social media might have for users internalizing symptoms, particularly for those with chronic pain. When compared to people without chronic pain, patients suffering from chronic pain report higher rates of internalizing symptoms (Noel et al., 2016). Although increased internalizing symptoms might precede the onset of chronic pain, chronic pain also serves to increase or worsen internalizing symptoms. Increased chronic pain also changes the ways in which individuals with pain participate in activities, with increasing avoidance of and disengagement from previously rewarding activities (Zelaya et al., 2020), including social activities. With increased social withdrawal, young adults with chronic pain may look towards other sedentary activities to fill their time. As social media continues to grow, young adults with chronic pain may turn to social media as a sedentary, low effort activity. Yet, it remains unclear whether and what types of increased social media use may be associated with greater internalizing symptoms in young adults with chronic pain. Therefore, this study aimed to fill a gap in the literature on the association between different functions of social media use and internalizing symptoms for young adults with chronic pain.

For some young adults with chronic pain, social media use can have positive benefits, especially when the function of social media use is accessing social support. Merolli et al., (2013) found social media can have many positive psychological benefits for adults with chronic

pain, as social media may increase social support and offer a place to share information. Additionally, Sendra and Farré (2020) found that some people with chronic pain use Instagram as a form of self-expression to aid in creating support and social connections, which is a common difficulty given the nature of chronic pain and related withdrawal from social activities. Active social media use can be beneficial when used for the purposes of social support, sharing information, and creating awareness around chronic pain (Merolli et al., 2013; Sendra & Farré, 2020). Thus, it is theorized that social media use for social engagement among young adults with chronic pain may be associated with lower internalizing symptoms.

In addition, although studies indicate positive functions of social media use in young adults with chronic pain, it is also important to understand possible negative functions. Passive social media use, or "...browsing, scrolling, reposting links, or looking at content from others," (Thorisdottir et al., 2019) has been associated with greater internalizing symptoms compared to active use (Thorisdottir et al., 2019). Additionally, problematic social media use has been characterized by excessive concern for social media, a strong motivation to use social media, and devoting enough time to social media that it affects other areas of life (Shensa et al., 2017). Shensa et al., (2017) found that this kind of problematic social media use was associated with an increase in depressive symptoms, whereas typical social media use was not. In addition to passive and problematic social media use, people may engage in social comparison during use. Engaging in social comparison during social media use increases internalizing symptoms, as evidenced through social comparison theory, wherein people compare themselves to those who they perceive as more competent (Reer et al., 2019). As it is usual for people to portray an idealized version of their life online, people with chronic pain might engage in social comparison while on social media, which may be associated with greater internalizing symptoms. Given

that social media use may be common for people with chronic pain, I theorized that passive or social comparison social media use may be associated with increased internalizing symptoms.

This study examined the associations between chronic pain, internalizing symptoms, and social media use in young adults. First, I hypothesized that young adults with chronic pain who engage in greater use of social media as a means of passive use or for personal identity (i.e., social comparison or problematic integration with sense of self) would experience higher levels of internalizing symptoms. Second, I hypothesized that young adults with chronic pain who engage in greater use of social media to expand social connection (i.e., active use) would experience fewer internalizing symptoms. In addition, the secondary objective of this research was to examine factors related to intensity of social media use that might strengthen or weaken the social media use functions and internalizing symptom associations: number of hours on social media, number of likes on social media, and number of posts on social media. First, I hypothesized that higher number of hours spent on, more likes on, and more posts on social media would strengthen the associations between greater internalizing symptoms and greater social media use functioning as passive or personal identity, whereas lower number of hours spent on, fewer likes on, and fewer posts on social media would weaken that association. Second, I hypothesized that higher number of hours spent on, more likes on, and more posts on social media would strengthen the association between lower internalizing symptoms and greater social media use functioning as social connection, whereas a lower number of hours, fewer likes on, and fewer posts on would weaken the benefits of social connection social media use.

Method

Participants

The study includes 225 young adults with chronic pain, ranging from 18-26 years old ($M=22.16$ years old $SD=2.35$ years). Out of the 225 young adults, the majority identified as White ($n=158$, 70%). Participants in this study also identified as Hispanic/Latino ($n=20$, 9%), biracial ($n=14$, 6%), Black or African American ($n=8$, 4%), Asian ($n=8$, 4%), other race, ethnicity, or origin ($n=4$, 2%), Middle Eastern or North African ($n=2$, $<.001$) and some declined to answer ($n= 11$, 5%). Participants identified as the following: 177 female/girl ($n=177$, 79%), 25 male/boy (11%), transgender ($n=9$, 4%), and do not identify as female, male, or transgender ($n=14$, 6%). Participants reported a chronic pain duration of 0-2 years (21%), 3-4 years (18%), 5-6 years (19%), 7-8 years (14%), 9-10 years (11%), 11-12 years (7%), and more than 12 years (9%). Participants reported the types of chronic pain that they experience. The most common types of chronic pain were migraines ($n= 82$, 36%), gastrointestinal pain ($n=48$, 21%), and arthritis ($n=22$, 10%). Other types of chronic pain endorsed were fibromyalgia ($n=12$, 5%), neurogenic pain ($n=6$, 3%), and other (not listed) pain ($n=121$, 54%). Participants ages 18 – 26 yrs old were recruited through Prolific, an online research recruitment platform. Inclusion criteria included: ability to read English, had current or a history of chronic pain, lived in the United States, and were able to complete an online survey. Exclusion criteria included active psychosis as it would have interfered with survey comprehension.

Procedure

Procedures were approved by the Institutional Review Board at the University of Vermont. Electronic consent was obtained prior to participants completing the survey. Recruitment began in September 2021. Participants completed an anonymous, online survey assessing chronic pain, internalizing symptoms, and social media use. Participants were given \$5

on completion of the survey. These questionnaires are part of a larger survey conducted by faculty supervisor Dr. Hughes Lansing that examined psychosocial experiences of young adults with chronic pain or a history of chronic pain in adolescence. Data collection ended in September 2021.

Measures

Internalizing Symptoms

Patient Health Questionnaire-8 (PHQ-8; Kroenke et al., 2010). The PHQ-8 is an 8-item questionnaire that asked the participant to rate how frequently they have experienced a specific depressive symptom in the last 2 weeks (0= “Not at all”, 3= “Nearly every day”). The PHQ-8 is scored by taking the sum of the answers given, with a clinical cutoff at a score of 10 or greater (Kroenke et al., 2010). In my sample, the PHQ-8 had good internal consistency ($\alpha = .84$).

Generalized Anxiety Disorder-7 (GAD-7; Kroenke et al., 2010). The GAD-7 is a 7-item survey that asked participants to report how frequently in the past 2 weeks they have experienced a specific symptom of anxiety (0= “Not at all”, 3= Nearly every day”). The GAD-7 is scored by taking the sum of the answers given, with a clinical cutoff at a score of 10 or greater (Spitzer et al., 2006). The GAD-7 had strong internal consistency in this sample ($\alpha = .91$).

Social Media Usage

Social Networking Sites Usage & Needs Scale (SNSUN; Ali et al., 2020). Functions of social media use were assessed using three subscales of the SNSUN; Diversion, Personal Integrative Needs, and Social Integrative Needs. The Diversion subscale is a 4-item scale that measured the extent to which social media was used as a distraction or for passive use (e.g., “I start using social networking sites when I have nothing better to do”) and was scored on a 5-point Likert scale (1= Strongly Disagree, 5= Strongly agree), and had low internal consistency ($\alpha = .65$) in

this sample. The Personal Integrative Needs subscale is a 4-item scale that measured the extent to which social media was a part of one's self-concept (e.g., "Social networking sites is part of my self-image") and was scored on a 5-point Likert scale (1= Strongly Disagree, 5= Strongly agree), and had good internal consistency ($\alpha = .81$) in this sample. The Social Integrative Needs subscale is a 5-item scale that measured the extent one used social media to fulfill social needs, (e.g., "Social networking sites allow me to find companionship") and was measured on a 5-point Likert scale (1= Strongly Disagree, 5= Strongly agree), and had acceptable internal consistency ($\alpha = .78$). Scoring for each of the subscales was completed by calculating the mean of the answers given.

Face Valid Items

Additionally, three face valid items developed for this project were used to assess the extent or intensity of social media use. The first item, "How much time do you spend on social media per week?", was rated on a 5-point scale; 1= 0-5 hours, 2= 6-11 hours, 3= 12-17 hours, 4= 18-23 hours, and 5= 24 hours or more. The second face valid item, "How many times do you post on social media per week?", was measured on a 5-point scale; 1= 0-2 times, 2= 3-5 times, 3= 6-8 times, 4= 9-11, 5= 12 or more times per week. The third item, "What is the average number of 'likes' you receive per post?" was measured on a 5-point scale; 1= 0- 39 likes, 2= 40-79 likes, 3= 80-119 likes, 4= 120-159 likes, and 5= 160 likes or more. Ranges in Likert scales for the three face valid items were similar to those found in validated social media scales, such as the Facebook Intensity Scale (Ellison et al., 2007) and Media and Technology Usage and Attitudes Scale (Rosen et al., 2013).

Analyses

There were two aims of the present study and all analyses were conducted in R (v4.0.2). The first aim was to examine the association between each function of social media use, Diversion, Personal Integrative Needs, and Social Integrative Needs, and symptoms of depression and anxiety. Pearson correlations were conducted to assess the association of the three subscales of functions of social media usage, depression, and anxiety. The second aim of this study was to examine factors related to the intensity of social media use as moderators (± 1 SD) of the associations between Diversion, Personal Integrative Needs, and Social Integrative needs social media usage and depression and anxiety symptoms. Specifically, the average number of likes, the average number of hours spent on social media a week, and average number of posts per week were examined as moderator of these associations. Linear regression analyses were conducted with variables grand mean centered and for any significant interactions simple slopes were probed to explore the pattern of the associations at high and low levels of the moderator.

Results

First, the bivariate associations of SNSUN subscales and internalizing symptoms were examined (Table 1). Ratings on the diversion subscale of the SNSUN were positively associated with anxiety scores ($r = .15, p = .02$) but not with depression scores ($r = .09, p = .18$). The personal integrative needs subscale was positively associated with anxiety scores ($r = .21, p = .002$) and depression scores ($r = .25, p < .001$). The social integrative needs subscale was also positively associated with the anxiety scores ($r = .15, p = .03$), but not with depression scores ($r = .09, p = .19$). The diversion subscale was also positively associated with personal integrative needs ($r = .20, p = .004$) and the social integrative needs ($r = .43, p < .001$). The personal integrative

needs subscale was also positively associated with the social integrative needs subscale ($r = .41$, $p < .001$).

Second, I examined intensity of use as moderators of significant bivariate associations. Assumptions of the regression analyses were tested prior to conducting regression analyses. Each regression analysis included the main effects of the social media use function and hours on social media (or likes, or number of posts), as well as the interaction of these two variables in predicting internalizing symptoms. Regression analyses were only conducted for outcomes that shared a significant bivariate association with social media use functions. The overall model of hours spent on social media as a moderator between the association of diversion and anxiety was significant ($R^2 = .10$, $F(3, 202) = 9.36$, $p < .0001$). Regression analyses indicated that the diversion subscale was no longer associated with anxiety ($b = .17$, $t(202) = .27$, $p = .81$), however hours spent on social media was positively associated with anxiety ($b = .66$, $t(202) = 1.99$, $p = .05$). The interaction between diversion and hours spent on social media was associated with anxiety ($b = 2.21$, $t(202) = 3.95$, $p = .0001$). Simple slope analyses were tested at low (-1 SD below the mean) and high (+1 SD above the mean) levels of hours spent on social media (Figure 1), which indicated that diversion is negatively associated with anxiety when hours on social media is low ($b = -2.42$, $SE = 1.08$, $p = .03$) and diversion is positively associated with anxiety when hours on social media is high ($b = 3.03$, $SE = .88$, $p = .0007$).

The overall model of hours spent on social media as a moderator between the association between social integrative needs and anxiety significant ($R^2 = 0.13$, $F(3, 202) = 9.57$, $p < 0.0001$). Regression analyses showed the social integrative needs subscale was associated with anxiety in the model ($b = 1.28$, $t(202) = 2.56$, $p = 0.011$), however, the hours spent on social media was not associated with anxiety ($b = 0.41$, $t(202) = 1.25$, $p = 0.21$). The interaction between

social integrative needs and hours spent on social media was associated with anxiety ($b = 1.43$, $t(202) = 3.33$, $p = 0.001$). Simple slope analyses were tested at low (-1 SD below the mean) and high (1+ SD above the mean) levels of hours spent on social media (Figure 2), which indicated that social integrative needs was positively associated with anxiety when hours on social media was high ($b = 3.06$, $SE = 0.732$, $p < 0.001$), however, social integrative needs was not significantly associated with anxiety when hours on social media was low ($b = -0.45$, $SE = 0.73$, $p = 0.53$).

Finally, consistent with the bivariate associations, all but three of the other overall models were significant with no significant interaction effects (see Tables 2-7 for hours of use models). Only the overall models for number of posts moderating the association between anxiety and diversion, depression and diversion, and depression and social integrative needs had non-significant overall models. These results indicated that number of hours spent on social media did not moderate the association between personal integrative needs and anxiety scores. Further, hours spent on social media did not moderate the association between all three SNSUN subscales and depression. Last, regression analyses indicated that number of likes per post and number of posts did not moderate the association between the three SNSUN subscales and either anxiety or depression.

Discussion

This study examined the association between types of social media use (diversion, personal needs, and social needs) and internalizing symptoms (depression and anxiety) and if those associations were moderated by levels of engagement with social media (hours spent on social media, number of likes on posts, and number of posts on social media). In partial support

of the hypothesis that social media use as a diversion and for personal needs would be positively associated with internalizing symptoms, higher ratings of social media use for the diversion subscale were associated with greater reported anxiety symptoms, whereas higher ratings of social media use for personal integrative needs was associated with greater depression and anxiety symptoms. Inconsistent with hypotheses, social media use as a diversion was not associated with depression and social media for social needs was positively, rather than negatively, correlated with anxiety and not correlated with depression. In partial support of hypotheses, hours spent on social media moderated the association of diversion and social needs media use with anxiety; however, hours spent on social media did not moderate the association between personal integrative needs and anxiety, nor any of the social media use functions and depression. Further, the hypothesis that number of likes and number of posts would moderate the association between the social media use functions and internalizing symptoms was not supported. These findings provide preliminary evidence of the associations of social media usage functions and internalizing symptoms as well as the role of hours of use in explaining some of those links in young adults with chronic pain.

First, the finding that greater social media use for diversion was associated with higher anxiety symptoms and that greater social media use for personal integrative needs was associated with higher depression and anxiety symptoms is supported by previous social media use research and consistent with social comparison theory. For example, Thorisdottir et al., (2019) found that passive social media use was related to increases in anxiety. Additionally, Verduyn et al., (2015) found that passive Facebook use led to declines in affective well-being in samples of undergraduate students and adults. Further, these findings are also consistent with social comparison theory. Social comparison theory states that people have a

drive to assess their abilities and opinions, however when there is no set standard for one's abilities, people will gain this information by comparing themselves to others (Festinger, 1954). Past research has shown an association between people who engage in more frequent social comparison and anxiety (Butzer & Kuiper, 2006). Lee (2014) found that people who had higher rates of social comparison on Facebook were higher in self-uncertainty, lower in self-esteem, and lower in self-consciousness. Additionally, Robinson et al. (2019) found that people who were more likely to compare themselves to others as better off than they were, people who indicated that they would be more bothered by being tagged in unflattering pictures, and people less likely to post pictures of themselves along with others were more likely to meet criteria for Major Depressive Disorder. Reer & Quandt (2019) also found that engaging in social comparison mediated the association between social media usage and depression and anxiety. Finally, as these data were cross-sectional, it may also be that individuals with greater anxiety or depression are more likely to use social media for passive diversion or personal integration to distract from worries, other distress, or disruptions in self-concept and identity (Gámez-Guadix, 2014; Oberst et al., 2017). Further research is needed to clarify the mechanisms and directions of effects linking diversion and personal needs functions of social media use with internalizing symptoms in young adults with chronic pain.

Second, the positive association between the Social Integrative Needs subscale and anxiety symptoms contrasts with my hypothesis and previous research. For example, Thorisdottir et al., (2019) found active social media use, such as use for social integrative needs, to be associated with a decrease in anxiety and depressed mood. Similarly, Brailovskaia (2020) found that use of social media to look for social interaction was negatively associated with depression and anxiety symptoms. In contrast, I found a small

positive association between social integrative need use and anxiety and no association with depression. It is possible that these results differed from previous research because (1) the current research was conducted during the COVID-19 pandemic and (2) the current sample was experiencing elevated anxiety and depression, both of which might impact social media consumption and functions. In the context of the COVID-19 pandemic, researchers found that both parents and children increased their social media usage at the start of social distancing (Drouin et al., 2020) and children who reported higher levels of anxiety were more likely to increase their use of social media during COVID-19 (Drouin et al., 2020). Consumption of disaster-related content on social media is also associated with anxiety (Zhao & Zhou, 2020). In the current sample, the mean scores for both the GAD-7 ($M= 10.40$) and PHQ-8 ($M= 10.69$) were above the clinical cut-off. Thus, for emerging adults with elevated anxiety and depression during the COVID-19 pandemic, increased time spent on social media and more exposure to disaster-related content may have disrupted the positive benefits of social integrative social media use for anxiety and depression seen in past samples. Additionally, since emerging adults with chronic pain have higher rates of internalizing disorders (Noel et al., 2016), it is possible that social media for social integrative needs functions differently for those already experiencing depression and anxiety with chronic pain regardless of the COVID-19 pandemic.

Third, the findings that number of hours spent on social media moderated the association between diversion and anxiety and social integrative needs use and anxiety build on past research suggesting an important role for hours spent on social media in understanding associations with anxiety. Specifically, I found that passive diversion use was only associated with elevated anxiety symptoms when hours spent on social media higher, and more passive

diversion use was beneficial (associated with lower anxiety) when hours on social media were lower. In addition, I found that social integrative needs use was, similarly, only associated with greater anxiety symptoms when hours spent on social media were higher and there was no association when hours on social media were lower. This is consistent with findings from Vannucci et al., (2017) that more time spent on social media was associated with greater dispositional anxiety. The importance of hours spent on social media might also be explained via social comparison theory, such that greater hours spent on social media may amplify opportunities for social comparison. Further, although the positive association between social integrative needs use and anxiety was inconsistent with past findings that this type of use was associated with lower anxiety (e.g., Brailovskaia, 2020; Thorisdottir et al., 2019), in my sample there was only this unanticipated positive association for those emerging adults with higher hours of social media use. This suggests that the previously found benefits of active social needs use might be more nuanced related to hours of social media use and the population studied. For example, as the mean of GAD-7 scores in the current sample of emerging adults with chronic pain was above the clinical cutoff ($M= 10.40$) it is possible that social media for social interaction for a high number of hours serves a different less beneficial function for persons where anxiety is already elevated, especially in the context of COVID-19 which drastically changed the way people were socially rewarded.

In addition, although hours of social media use, likes, and posting frequency did not moderate the remaining associations between functions of social media usage and depression as we hypothesized, these findings are not entirely inconsistent with research suggesting that time on social media is not always associated with internalizing symptoms. In a study conducted by Shensa et al. (2017), researchers found that time spent on social media was not associated

with depressive symptoms. Additionally, Coyne et al. (2020) conducted a longitudinal study that found a moderately significant association between time spent on social media and internalizing symptoms in a between subjects design, but the association was not significant in a within subjects design. However, Vannucci et al. (2019) split participants into groups based on social media usage and found that membership in the high overall social media use group did predict more depressive symptoms. Further, Lee et al. (2020) found that adolescents assigned to receive fewer likes felt more rejection than when they received more, suggesting a roles for likes on posts in understanding internalizing symptoms. Unfortunately, there is limited research examining posting behavior and internalizing symptoms. Given the mixed findings on the intensity of social media use, function of social media use and internalizing symptoms, future research should attempt to further tease apart these nuanced associations, especially in populations such as emerging adults with chronic pain that may be more likely to engage with social media.

Limitations

Findings from the current study should be taken in context of its limitations. First, the sample was quite homogenous, with most participants identifying as White and female, because of this, the findings may not translate to more diverse populations. Additionally, the majority of the sample reported their pain to be migraines or pain not listed. Due to people with migraines frequently experiencing photosensitivity, the results might not generalize to populations with other types of pain, as people with migraines might be engaging in social media differently. Second, data collection occurred during the COVID-19 pandemic, post-lockdown mandates, therefore people might have been engaging in social media differently than they had pre-COVID-19. Third, due to the nature of the study being cross-sectional, the direction of

effects between social media and internalizing symptoms cannot be determined. Sixth, the SNSUN is a new measure and currently there are no validation studies for this measure, therefore replication of these findings is necessary. Seventh, there is no measure examining the magnitude of social media use in terms of hours spent, likes per post, and posts per week, therefore this study utilized face valid questions to measure these variables. Lastly, the mean scores for both internalizing measures, PHQ-8 and GAD-7, were above the clinical cut-off. Therefore, the results may not be generalizable to populations that fall below the cut-off point.

Conclusions

The current study provides preliminary data to fill the gap in understanding the association of social media use with internalizing symptoms for individuals who experience chronic pain. The findings indicate that all types of social media use, for diversion, for personal needs, and for social needs, were associated with greater anxiety symptoms, and that social media for personal needs was associated with greater depression symptoms. Findings also indicated that hours spent on social media moderated the association between social media use for diversion and social needs, and anxiety symptoms, with greater hours on social media amplifying the association between that type of use and greater anxiety. These findings could partially be explained by social comparison theory which proposes that people have an innate drive to know how they are doing, and to do so they will compare themselves to set standards, however, when there are no set standards to compare to, they will compare themselves to other people (Festinger, 1954). As people tend to post their idealized selves and lives on social media (Ma et al., 2017), it creates an environment filled with opportunities for social comparison, which has been shown to be associated with internalizing symptoms (Butzer & Kuiper, 2006; Reer et al., 2019). Future research should use a longitudinal design

to establish directionality of these effects and test mechanisms such as that delineated via social comparison theory.

The continued examination of the effects of social media on internalizing symptoms and the effects of internalizing symptoms on social media use for people with chronic pain can help expand current knowledge on these associations and better inform social media use recommendations for this population. First, this research should be conducted with a more diverse population to better understand if these results are generalizable to other populations. Second, research should also investigate the effect of severity of pain on social media use, as more severe pain could lead to engaging in less socially rewarding activities and, in turn, more social media use. Additionally, future research should test social comparison theory as a mechanism underlying the associations between these dimensions of social media use and internalizing symptoms. As this research only found one significant moderator, future studies should investigate the effects of other possible moderators on the relationship between social media use and internalizing symptoms, such as the use of different social media platforms and type of pain. Lastly, future interventions should consider the associations of social media use and internalizing symptoms for individuals with chronic pain, especially as researchers explore interventions using social media as an accessible medium for those with chronic pain.

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Table 1

Means, standard deviations, and correlations with confidence intervals

Variable	<i>M</i>	<i>SD</i>	1	2	3	4	5	6	7	8	9	10	11	12
1. PHQ	10.69	5.48												
2. GAD	10.39	5.80	.75** [.69, .81]											
3. Personal Integrative Needs	2.92	1.03	.25** [.12, .37]	.21** [.08, .33]										
4. Social Integrative Needs	3.64	0.89	.09 [-.04, .22]	.15* [.02, .28]	.41** [.30, .51]									
5. Diversion	3.94	0.69	.09 [-.04, .22]	.15* [.02, .28]	.20** [.06, .32]	.43** [.31, .53]								
6. age	22.16	2.34	-.14* [-.26, -.00]	-.08 [-.21, .05]	-.14* [-.27, -.01]	-.01 [-.14, .12]	.01 [-.12, .14]							
7. Race	6.52	1.56	-.09	-.07	.01	-.06	.07	.04						

Table 2

Regression results using GAD-7 as the criterion

Predictor	<i>b</i>	<i>b</i>		<i>sr</i> ²	<i>sr</i> ²		Fit	
		95% CI [LL, UL]			95% CI [LL, UL]			
(Intercept)	10.09**	[9.30, 10.88]						
Diversion	0.73	[-0.48, 1.95]		.01	[-.01, .03]			
Hours	0.61	[-0.02, 1.25]		.02	[-.02, .05]			
Diversion*	1.27**	[0.45, 2.09]		.04	[-.01, .09]			
Hours								
							<i>R</i> ² = .078**	
							95% CI[.02,.15]	

Note. A significant *b*-weight indicates the semi-partial correlation is also significant. *b* represents unstandardized regression weights. *sr*² represents the semi-partial correlation squared. *LL* and *UL* indicate the lower and upper limits of a confidence interval, respectively.

* indicates $p < .05$. ** indicates $p < .01$

Table 3

Regression results using PHQ-8 as the criterion

Predictor	<i>b</i>	<i>b</i>		<i>sr</i> ²	<i>sr</i> ²		Fit
		95% CI [LL, UL]			95% CI [LL, UL]		
(Intercept)	10.51**	[9.74, 11.28]					
Diversion	0.24	[-0.95, 1.43]		.00	[-.01, .01]		
Hours	0.64*	[0.02, 1.26]		.02	[-.02, .05]		
Diversion*	0.70	[-0.09, 1.50]		.01	[-.02, .04]		
Hours							
							<i>R</i> ² = .040*
							95% CI[.00,.09]

Note. A significant *b*-weight indicates the semi-partial correlation is also significant. *b* represents unstandardized regression weights. *sr*² represents the semi-partial correlation squared. *LL* and *UL* indicate the lower and upper limits of a confidence interval, respectively.

* indicates $p < .05$. ** indicates $p < .01$.

Table 4

Regression results using GAD-7 as the criterion

Predictor	<i>b</i>	<i>b</i> 95% CI [LL, UL]	<i>sr</i> ²	<i>sr</i> ² 95% CI [LL, UL]	Fit
(Intercept)	10.33**	[9.54, 11.12]			
Personal Integrative Needs Hours	1.12**	[0.34, 1.90]	.04	[-.01, .08]	
Personal Integrative Needs *Hours	0.47	[-0.16, 1.09]	.01	[-.02, .03]	
	0.35	[-0.21, 0.92]	.01	[-.01, .03]	
					<i>R</i> ² = .069** 95% CI[.01,.13]

Note. A significant *b*-weight indicates the semi-partial correlation is also significant. *b* represents unstandardized regression weights. *sr*² represents the semi-partial correlation squared. *LL* and *UL* indicate the lower and upper limits of a confidence interval, respectively.

* indicates $p < .05$. ** indicates $p < .01$.

Table 5

Regression results using PHQ-8 as the criterion

Predictor	<i>b</i>	<i>b</i> 95% CI [LL, UL]	<i>sr</i> ²	<i>sr</i> ² 95% CI [LL, UL]	Fit
(Intercept)	10.63**	[9.88, 11.39]			
Personal Integrative Needs Hours	1.24**	[0.50, 1.99]	.05	[-.01, .10]	
Personal Integrative Needs *Hours	0.37	[-0.23, 0.97]	.01	[-.01, .03]	
	0.23	[-0.31, 0.77]	.00	[-.01, .02]	
					$R^2 = .075^{**}$ 95% CI[.01,.14]

Note. A significant *b*-weight indicates the semi-partial correlation is also significant. *b* represents unstandardized regression weights. *sr*² represents the semi-partial correlation squared. *LL* and *UL* indicate the lower and upper limits of a confidence interval, respectively.

* indicates $p < .05$. ** indicates $p < .01$.

Table 6

Regression results using GAD-7 as the criterion

Predictor	<i>b</i>	<i>b</i>		<i>sr</i> ²	<i>sr</i> ²		Fit
		95% CI [LL, UL]			95% CI [LL, UL]		
(Intercept)	10.21**	[9.43, 11.00]					
Social Integrative Needs	0.67	[-0.25, 1.59]		.01	[-.02, .03]		
Hours Social Integrative Needs	0.54	[-0.09, 1.17]		.01	[-.02, .04]		
Hours	0.83	[0.16, 1.49]		.03	[-.02, .07]		
					<i>R</i> ² = .062**		
					95% CI[.01,.12]		

Note. A significant *b*-weight indicates the semi-partial correlation is also significant. *b* represents unstandardized regression weights. *sr*² represents the semi-partial correlation squared. *LL* and *UL* indicate the lower and upper limits of a confidence interval, respectively.

* indicates *p* < .05. ** indicates *p* < .01.

Table 7

Regression results using PHQ-8 as the criterion

Predictor	<i>b</i>	<i>b</i> 95% CI [LL, UL]	<i>sr</i> ²	<i>sr</i> ² 95% CI [LL, UL]	Fit
(Intercept)	10.58**	[9.81, 11.34]			
Social Integrative Needs	0.21	[-0.69, 1.11]	.00	[-.01, .01]	
Hours Social Integrative Needs	0.60	[-0.01, 1.21]	.02	[-.02, .05]	
*Hours	0.48	[-0.17, 1.12]	.01	[-.02, .04]	
					<i>R</i> ² = .035 95% CI[.00,.09]

Note. A significant *b*-weight indicates the semi-partial correlation is also significant. *b* represents unstandardized regression weights. *sr*² represents the semi-partial correlation squared. *LL* and *UL* indicate the lower and upper limits of a confidence interval, respectively.

* indicates $p < .05$. ** indicates $p < .01$.

Figure 1: Hours of use as a moderator of the association between Diversion use and GAD-7 Scores

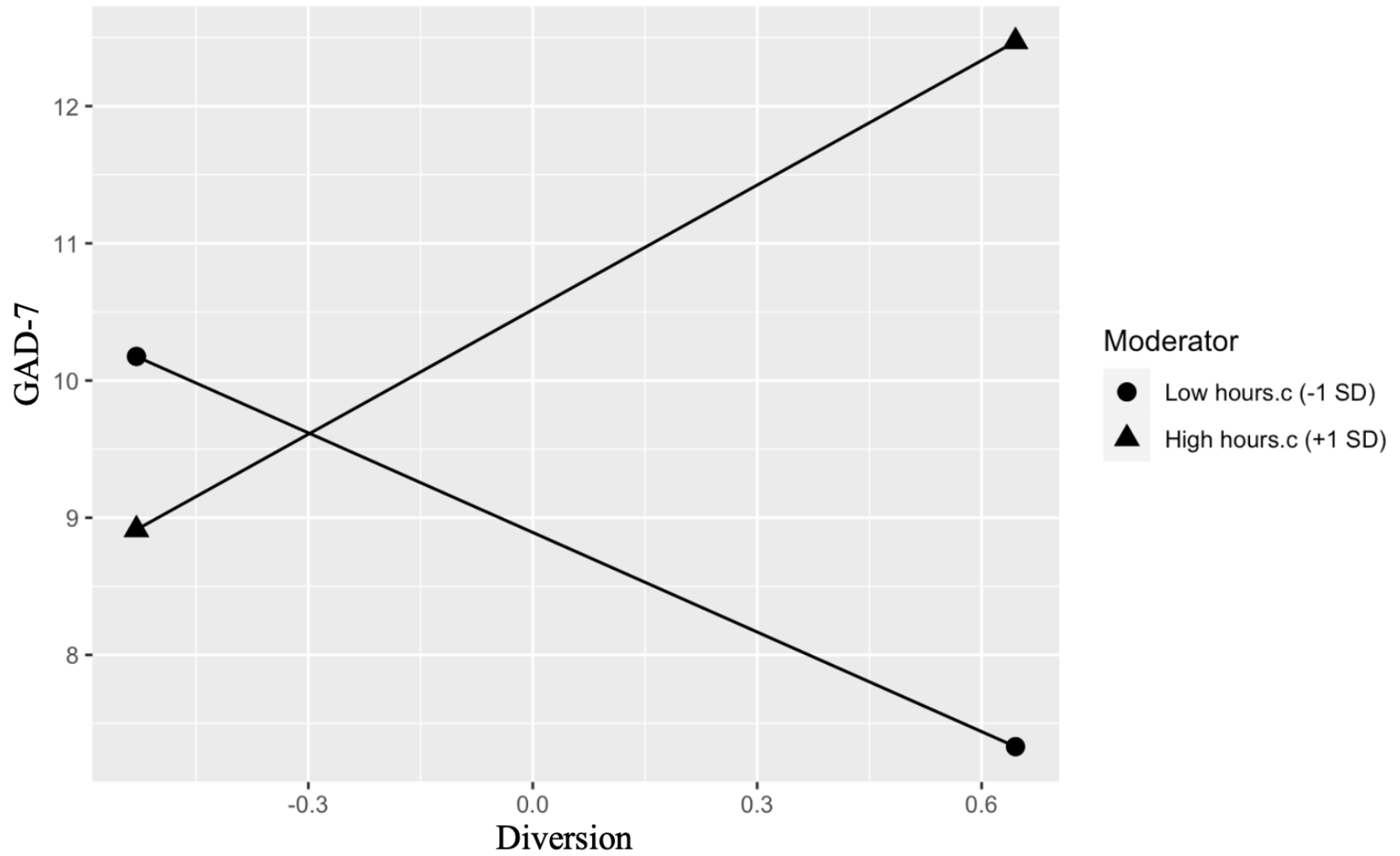


Figure 2: Hours of use as a moderator of the association between Social Integrative Needs use and GAD-7 Scores

