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Media Multitasking is Associated with Symptoms of Depression and Social Anxiety

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Abstract

We investigated whether multitasking with media was a unique predictor of depression and social anxiety symptoms. Participants (N=318) completed measures of their media use, personality characteristics, depression, and social anxiety. Regression analyses revealed that increased media multitasking was associated with higher depression and social anxiety symptoms, even after controlling for overall media use and the personality traits of neuroticism and extraversion. The unique association between media multitasking and these measures of psychosocial dysfunction suggest that the growing trend of multitasking with media may represent a unique risk factor for mental health problems related to mood and anxiety. Further, the results strongly suggest that future research investigating the impact of media use on mental health needs to consider the role that multitasking with media plays in the relationship.

The recent dramatic increase in media use<sup>1</sup> has been accompanied by a rising concern that interactions with media may be replacing face-to-face interactions<sup>2</sup>, resulting in lower quality social interactions<sup>3,4</sup> and impaired psychosocial functioning<sup>5,6</sup>. Consistent with these concerns, a number of early studies reported associations between heavy media use and mental health problems<sup>5,7,8</sup>. More recent research has suggested that the relationship between media use and psychosocial functioning is more complex and nuanced<sup>9,10</sup>. Specifically, it has been suggested that this relationship may depend on the type of media being used<sup>11</sup>, the purpose for which it is being used<sup>12,13</sup>, and the individual personality characteristics of the user<sup>14-16</sup>.

Although this more nuanced approach acknowledges that “what” people are doing with media has rapidly changed, it generally ignores that “how” people interact with media has also undergone a dramatic shift. Specifically, there has been a tremendous increase in the amount of time that people spend multitasking with media (simultaneously accessing two or more forms of media). Indeed, while overall media use among America’s youth increased by 20% over the past decade, the amount of time spent multitasking with media (simultaneously interacting with more than one form of media) increased by over 119% over the same time period<sup>1</sup>.

This dramatic shift in how people engage with media may be important to understanding the relationship between media use and mental health. Recent reports suggest that media multitasking may be uniquely associated with deficits in basic cognitive processes such as the ability to successfully filter out irrelevant information and ignore distraction<sup>17</sup>. Further, this type of poor attentional control has been suggested to maintain, and perhaps cause, depression<sup>18</sup> and anxiety<sup>19</sup>. The finding that multitasking with media may be associated with poor attentional control coupled with the findings that attentional control is related to psychosocial functioning, begs the question of whether multitasking with media may be a unique risk factor for poor mental health.

Here we indexed participants' overall media usage and media multitasking to investigate the extent to which these aspects of media use are associated with depression and/or social anxiety. We targeted these disorders because they are among the most common mental disorders<sup>20</sup> and both have been associated with both media usage<sup>5, 21</sup> and attentional control<sup>18, 19</sup>. We were particularly interested in the possibility that media multitasking might represent a specific risk factor for psychosocial dysfunction, independent of both dispositional risk factors (i.e., personality traits) and overall media use. Thus, prior to evaluating the relationship between media multitasking and psychological wellbeing, we controlled for both overall media use and the well-known associations between the traits of neuroticism and extraversion and mood and anxiety disorders<sup>22</sup>.

### Methods

Three hundred and nineteen college undergraduates (222 females) completed a battery of online surveys for course credit or extra-credit.<sup>1</sup> The Patient Health Questionnaire (PHQ)<sup>23</sup> and Social Phobia Inventory (SPIN)<sup>24</sup> were used to measure depressed mood and social anxiety, respectively. Participants also completed the neuroticism and extraversion scales of the Big Five Inventory (BFI)<sup>25</sup>. The above measures are all well-established survey measures.

The Media Multitasking Index Questionnaire<sup>17</sup> was used to index total media use and media multitasking. This measure was developed by Ophir, Nass, and Wagner<sup>17</sup>. It asks participants how many hours per week they use each of the following 12 primary forms of media: television, computer-based video, music, non-musical audio, video or computer games, telephone and mobile phone, instant messaging, SMS (text messaging), email, web surfing, and other computer based applications (such as word processing). Then for a given primary media form, participants indicate how often they use this media concurrently with the each of the other 11 media forms. This is done by making 11 ratings of "Most of the time (=1)," "Some of the time (=0.67)," "A little of the time (=0.33)," or "Never (=0)". These

eleven responses are summed to provide a measure of the average amount of concurrent media used while using that primary form of media. This sum is then multiplied by the number of hours using that form of media and divided by the total amount of time using all forms of primary media. This gives an index for that form of primary media. This index is calculated for each of the primary forms of media and the overall MMI score is the sum of these individual indexes. Thus, the MMI indicates the average amount of media multitasking that is occurring during a typical hour of media usage.

## Results

Table 1 presents the descriptive statistics for our personality survey measures and Table 2 presents the correlation matrix between our measures. As hypothesized, media multitasking was significantly related to overall media use, depression, and social phobia. To evaluate potential unique relations between media multitasking and psychosocial functioning, we conducted two hierarchical multiple regression analyses, one with the social anxiety (SPIN) and the second with the depression (PHQ) measure as the dependent variable. Predictors were entered into the regression model in three steps and the change in  $R^2$  from one step in the model to the next was used to evaluate whether the additional factor was uniquely associated with the dependent variable. The first step consisted of the neuroticism and extraversion scales from the BFI to control for dispositional factors associated with mood and anxiety disorders<sup>22</sup>. The second step added the total media usage ( $M=70.6$  hours,  $SD=48.8$ ) factor to control for overall media use. The third step added media multitasking ( $M=4.31$ ,  $SD=1.77$ ). We used this approach because the second stage of the model included personality and media factors that have been previously suggested to be related to depression and/or anxiety, while the third allowed us to determine whether media multitasking adds a unique contribution to the model above and beyond these previously known factors.

Results from regression analyses are given in Table 2. When social anxiety (SPIN) was the dependent variable, the model containing only extraversion and neuroticism was a significantly better fit than the base model [ $R^2$  change = .27,  $F(2, 316) = 59.33$ ,  $P < .001$ ]; adding total media usage in the second step did not significantly improve the model's fit [ $R^2$  change = .004,  $F(1, 315) = 1.68$ ,  $P = .20$ ], but adding media multitasking in the third step significantly improved the fit of the model [ $R^2$  change = .03,  $F(1, 314) = 14.88$ ,  $P < .001$ ]. When depression (PHQ) was the dependent variable, the model with neuroticism and extraversion was a better fit than the base model [ $R^2$  change = .21,  $F(2, 316) = 42.96$ ,  $P < .001$ ], adding total media usage improved the model fit [ $R^2$  change = .03,  $F(1, 315) = 12.43$ ,  $P < .001$ ], and adding the multitasking factor further improved the model's fit [ $R^2$  change = .03,  $F(1, 314) = 11.31$ ,  $P = .001$ ].

### Discussion

After controlling for both personality traits (neuroticism and extraversion) and overall media use, media multitasking was a unique predictor of both depression and social anxiety. Consistent with the claim that media multitasking represents a unique risk factor, overall media use was not associated with social anxiety but multitasking was. In addition, although both media multitasking and neuroticism were associated with higher scores on depression and social anxiety measures, neuroticism and media multitasking were themselves uncorrelated (see Table 1). This finding provocatively suggests that the personality traits of neuroticism and extraversion may be related to one's dispositional susceptibility to mood and anxiety problems, whereas media multitasking may be an environmental variable that is associated with increased susceptibility to mood and anxiety problems regardless of one's predisposition.

This is the first report of an association between increased media multitasking and self-reported symptoms of depression and anxiety. In addition, the fact that this association persists even when one

controls for personality factors that have been consistently shown<sup>22</sup> to predispose poor psychosocial functioning (neuroticism and extraversion) and overall media use, suggests that the multitasking aspect of media use is a unique risk factor for psychosocial dysfunction. This finding implies that a thorough understanding of the association between media use and mental health needs to consider not only what types of media people are using, but how they are engaging with those media.

Specifically, it will be important for future investigations to pursue whether media multitasking causes increased depression and social anxiety symptoms or is a result of those symptoms. At this point we could envision the causal arrow going either direction. For instance, the decreased top-down attentional control associated with media multitasking<sup>17</sup> could disrupt active coping mechanisms that promote the rapid shift of attention away from negative stimuli<sup>26</sup>, thereby resulting in heightened anxiety or depression. Alternatively, it is possible that people who are socially anxious or depressed use multitasking with media as a distraction technique to avoid experiencing negative emotional states<sup>27</sup>. Given the rapid increase in media multitasking, understanding the source of the behavior's relationship to depression and social anxiety is timely and may have important implications for understanding how to minimize the negative impacts of increased media use.

Footnotes

<sup>1</sup> Based on a the Personality Assessment Inventory Infrequency scale <sup>28</sup> data from 44 additional participants were identified as not sufficiently attending to the content of the assessment questions. Their data were eliminated from further analysis.

**Table 1: Summary statistics of survey measures.**

	<u>Mean</u>	<u>SD</u>	<u>Range</u>	<u>Cronbach's <math>\alpha</math></u>
<u>Neuroticism</u>	2.89	.75	1.13-4.63	.83
<u>Extraversion</u>	3.33	.77	1.13-5.00	.87
<u>SPIN (Anxiety)</u>	15.28	15.28	0-59	.93
<u>PHQ (Depression)</u>	5.22	4.90	0-27	.89

**Table 2: Correlations between measures.**

	<u>Neuroticism</u>	<u>Extraversion</u>	<u>SPIN</u>	<u>PHQ</u>	<u>Media Use</u>	<u>Multitasking</u>
<u>Neuroticism</u>	1					
<u>Extraversion</u>	-.20**	1				
<u>SPIN (Anxiety)</u>	.35**	-.45**	1			
<u>PHQ (Depression)</u>	.46**	-.16	.40**	1		
<u>Total Media Use</u>	.01	.09	.03	.17*	1	
<u>Media Multitasking</u>	-.01	.06	.17*	.20**	.36**	1

\* =  $p < .01$ ; \*\* =  $p < .001$

**Table 3: Model fits for the full regression models.**

<u>Dependent</u>	<u>Factor</u>	<u>Beta</u>	<u>t</u>	<u>P</u>
<b>Social Anxiety (SPIN)</b>	Neuroticism	.27	5.67	<.001
	Extroversion	-.41	8.48	<.001
	Total Media	-.006	.12	.90
	Multitasking	.19	3.86	<.001
<b>Depression (PHQ)</b>	Neuroticism	.44	8.97	<.001
	Extroversion	-.09	1.77	.08
	Total Media	.11	2.17	.031
	Multitasking	.17	3.36	.001

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