

Smartphone Usage: Associations with Attention, Sleep, and Impulsiveness



Jay Grzybowski, Christine Le, Clara Gland, Emily Kerr, Megan Gawlitta, Grace Thompson, Rebecca Sheetz, Claire Kidwell
 Faculty Mentor: Dr. David S. Leland
 Psychology Department ♦ University Of Wisconsin – Eau Claire

Introduction

College students' smartphone use presents concerns with academic dishonesty, distraction, sleep disturbances, and social withdrawal. We of the CHEEZ (Cognition and Human Electroencephalography Zone) conducted a survey to focus on the relationship between phone use/attitudes, attention, and impulsiveness. We assessed how much students use their phone, how reliant they are on their phone, and their concerns about not having access to their phone. Regarding attention, we asked them about their difficulties with attention and focusing on the present moment, i.e. mindfulness. We also asked about their inability to focus or concentrate which could lead to impulsiveness. We predicted a positive relationship between smartphone use/problems and ADHD-related difficulties (Adler et al., 2005). We also predicted correlations to other attention-related measures, showing positive relationships for impulsiveness and negative relationships for mindfulness, which is inversely related to attention.

Method

Participants:

124 UWEC students (106 female, 12 male, 6 non-binary; age 18+; 88% White, 8% Asian, 2% Black, 2% Other) completed our survey. After excluding 5 outliers, we included 119 participants in our analysis.

Procedure:

Students were recruited through the SONA system and email. Participants completed a 20-25 minute online Qualtrics survey. Informed consent was obtained at the start of the survey. All instructions were provided in the survey itself. Deception was not involved.

Survey Measures:

NMP-Q: Nomophobia Questionnaire (Yildirim, 2015; 20 items)

(1-7 Strongly Disagree to Strongly Agree) Fear of being without a phone, e.g. "Running out of battery in my smartphone would scare me"

MAAS: Mindful Attention Awareness Scale (Brown & Ryan, 2003; 15 items) (1-6 Almost Always to Almost Never) (larger MAAS scores indicate greater mindfulness) Rarely exhibiting unmindful behaviors, e.g. "I do jobs or tasks automatically, without being aware of what I'm doing."

ASRS: Adult Self-Report Scale for ADHD (Adler et al., 2005; 18 items).

(1-5 Never to Very Often) Assesses possible symptoms of ADHD, but does not diagnose, e.g. "How often do you have difficulty keeping your attention when you are doing boring or repetitive work?"

ABIS: Barratt Impulsiveness Scale (Abridged version)

(1-4 Rarely/Never to Almost Always/Always) Assesses impulsive decision making and contains three subscales: inattention, spontaneous action, and lack of planning e.g. "I say things without thinking"

Sleep Questions:

- (1-5 Very Poor to Very Good) "Rate your quality of sleep on a typical night."
- "How many hours of sleep do you get on a typical night?"
- (1-5 Very Much to Not at All) "Thinking about the past month, to what extent has poor sleep affected your concentration, productivity, or ability to stay awake?"
- (1-13, 0-9 Minutes to 2+ Hours) "How long does it typically take you to fall asleep?"
- (Yes or No) "Do you typically use your phone in bed just before trying to fall asleep?"

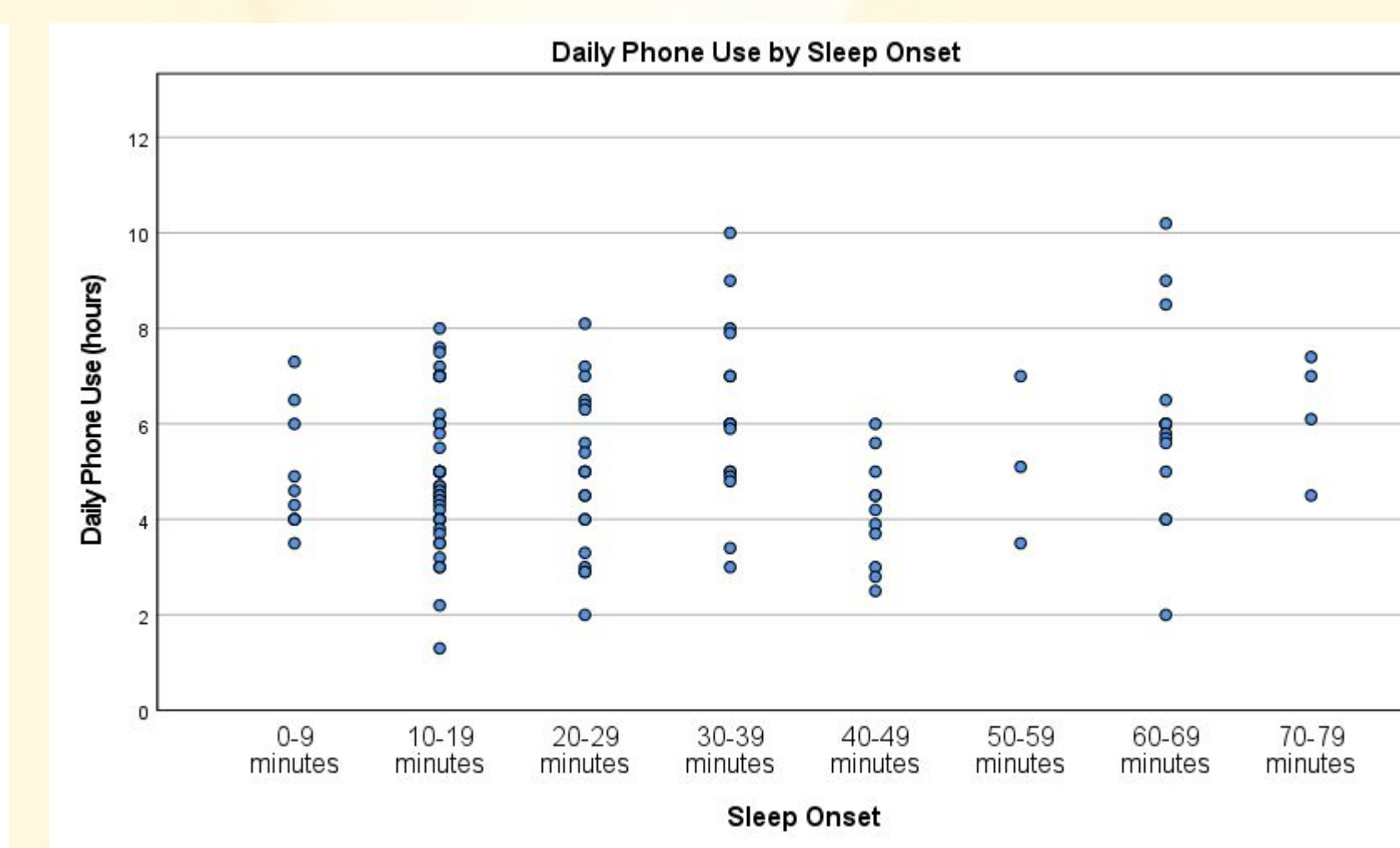
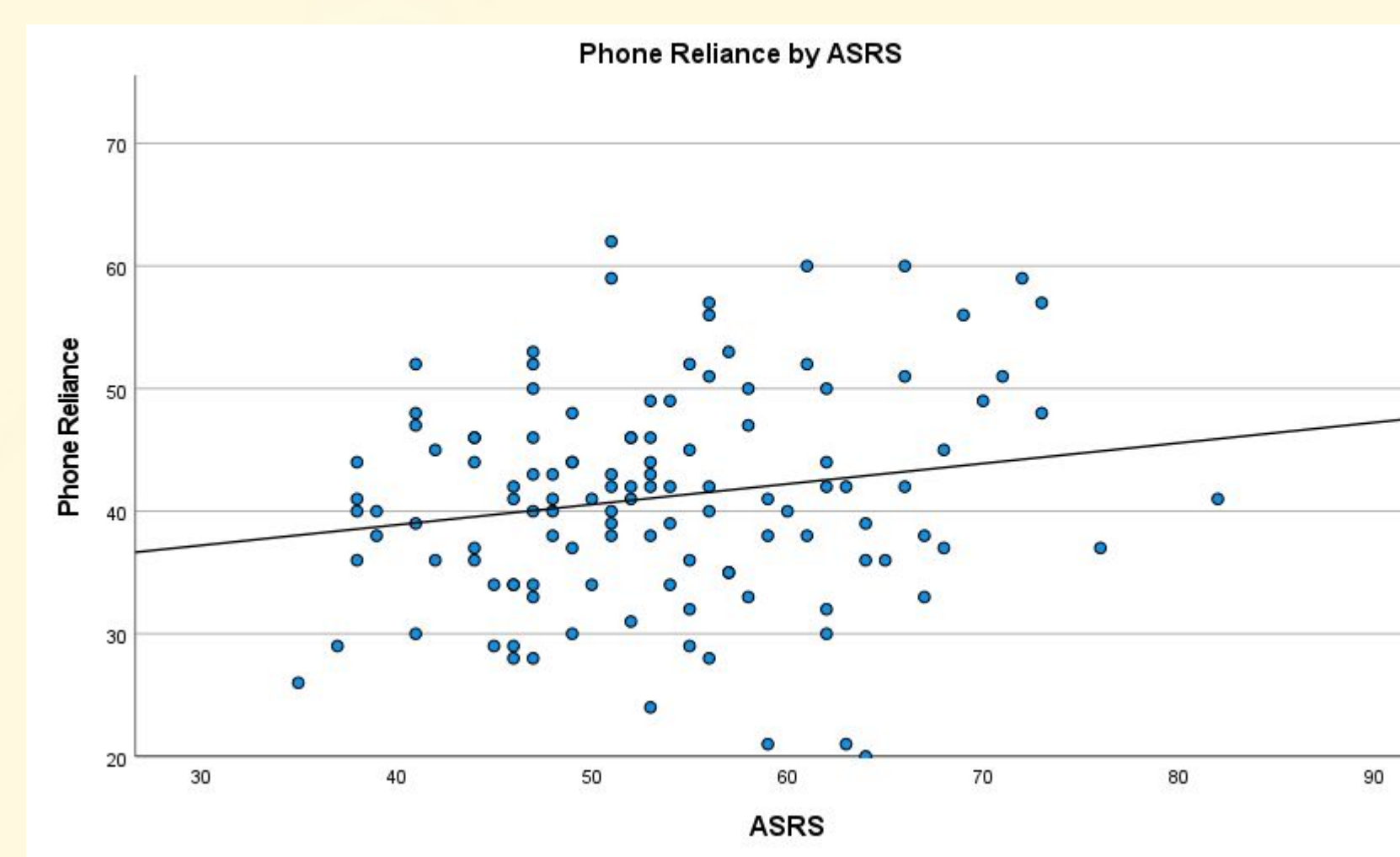
Acknowledgements

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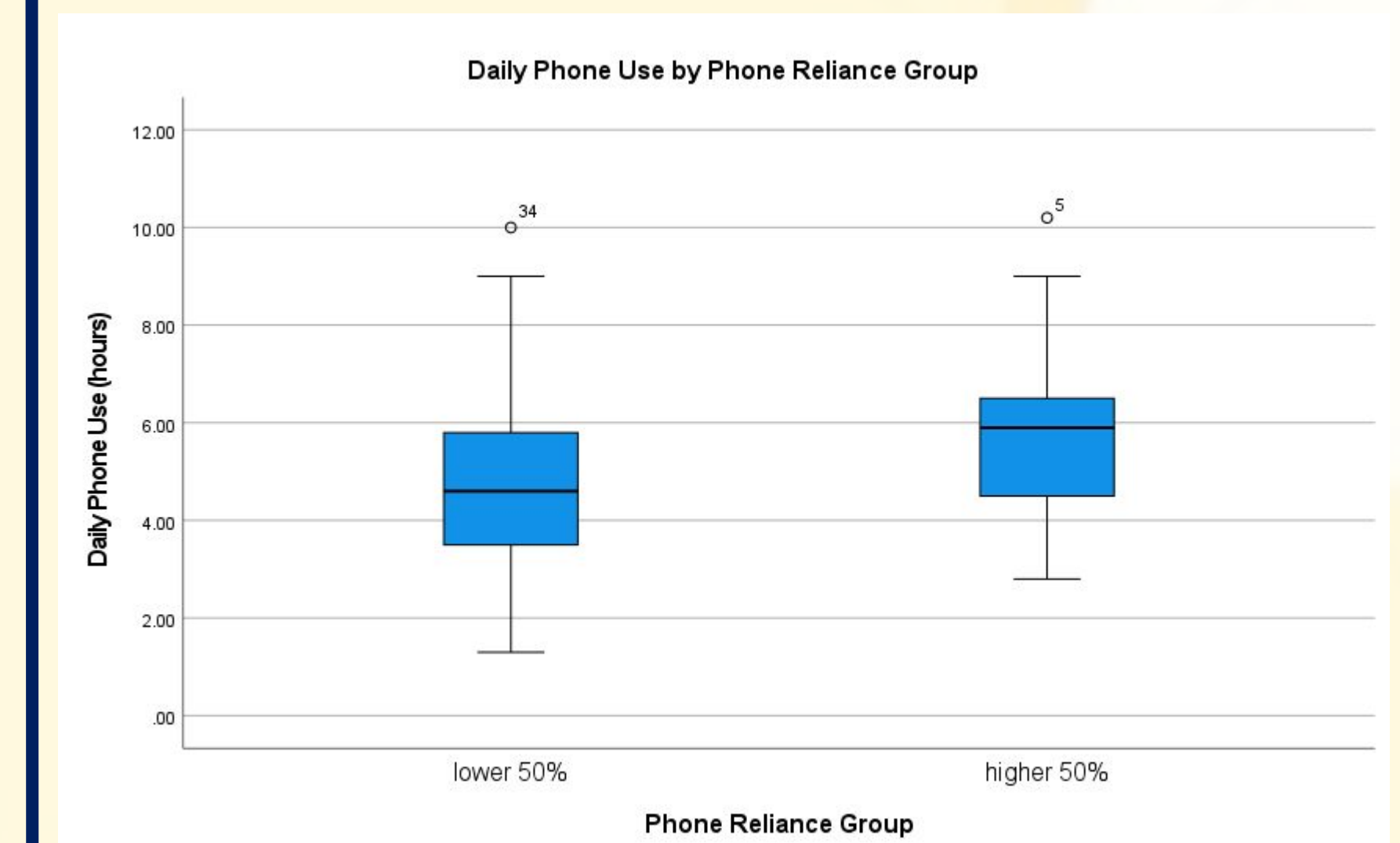
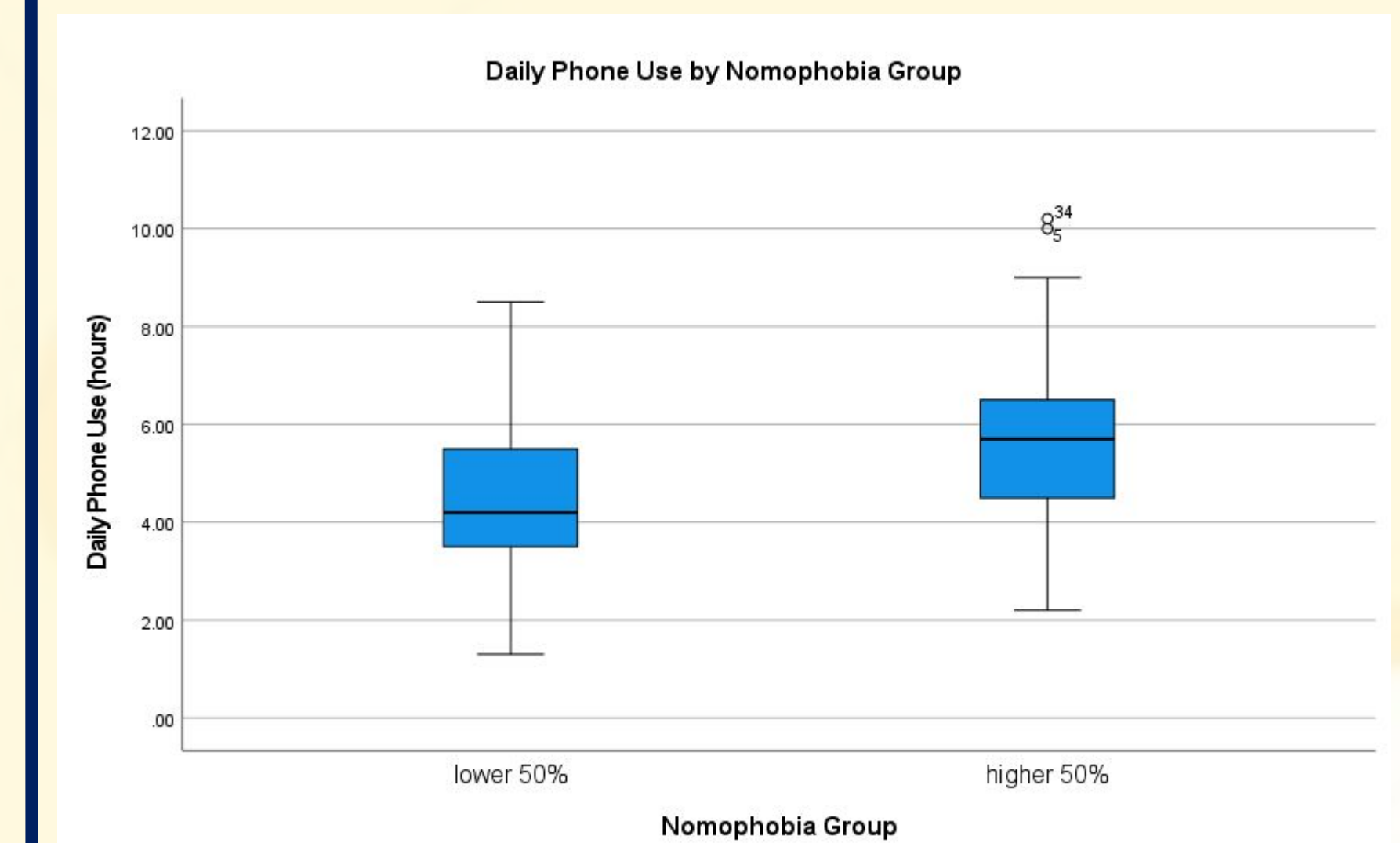
Results

		ABIS	MAAS	ASRS	Hours of Sleep	Sleep Quality	Poor Sleep Effects	Onset of Sleep
Daily Phone Use	Pearson Correlation (r)	0.11	-0.09	0.15	-0.14	-0.13	-0.16	0.19
	Significance (2-tailed)	0.24	<i>0.36</i>	<i>0.10</i>	0.13	<i>0.17</i>	<i>0.08</i>	<i>0.04</i>
Nomophobia	Pearson Correlation (r)	0.02	-0.17	0.16	0.02	-0.02	-0.15	0.08
	Sig (2-tailed)	0.87	<i>0.06</i>	<i>0.08</i>	0.85	0.85	<i>0.12</i>	0.38
Reliance	Pearson Correlation (r)	0.05	-0.18	0.21	0.06	0.10	-0.09	-0.07
	Sig (2-tailed)	0.59	<i>0.05</i>	<i>0.02</i>	0.51	0.29	<i>0.34</i>	0.43

Correlations with significant p values are highlighted in yellow. Significant correlations from the previous survey, which included 455 total participants (364 females, 82 males, 7 non-binary), are in *italics and red*.



Participants with higher nomophobia scores spent **5.7** hours on their phones per day on average, as opposed to participants with lower scores, who spent **4.6** hours per day ($p < 0.001$). Participants with higher phone reliance scores spent **5.7** hours on their phones per day on average, while participants with lower phone reliance scores spent **4.8** hours per day ($p = 0.004$).



Discussion

Main Findings:

Those who were most reliant on their phones reported the most attention-related difficulties. Those who used their phones the most took the longest time to fall asleep. There was not a significant relationship between impulsiveness and any of the three phone measures. There was not significant relationships between mindfulness and any of the three phone measures. The results related to mindfulness are in contrast to what we have previously found. Previously, we have found significant correlations between MAAS and ASRS on the one hand and all three phone measures on the other hand. This may be because previously, we have had a greater number of participants and more statistical power to find associations. Attention and sleep issues could be a cause or consequence of problematic phone use. That is, excessive phone use could have negative impacts on sleep and attention but it is also possible that those who already suffer from attention or sleep problems are inclined to use their phones more or more problematically. The participants of the survey are predominantly Caucasian and female. This limits our ability to generalize the results to a wider population.

Future Research:

We are currently conducting an EEG study to investigate attention-related brain responses in association with smartphone use/problems. We are also planning to run correlations with ABIS subscales, as it was previously found that the overall ABIS is not correlated, but perhaps the attention subset could be.

We acknowledge that UW-Eau Claire occupies the sacred and ancestral lands of Indigenous Peoples. We honor the land of the Ojibwe and Dakota Nations.