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Psychosocial Needs and Factors Contribute to Problematic Phone Use while Driving

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Problematic Phone Use

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❑ **Cell phones (especially smartphones) have become essential in daily life**

- In 2020, 106 subscriptions per 100 people worldwide (The World Bank, 2022)
- 106 subscriptions per 100 people in the U.S.
- 127 subscriptions per 100 people in Sweden

- People spend 4+ hours on phone -> about 50 days a year (Curtin, 2018; Statista, 2022)
- People check their phones 58 times a day; it takes several minutes to get back to deep focus (Mark et al., 2008)
- Phone addition and nomophobia (no mobile phone phobia) (Roberts et al., 2014; (Bragazzi & Del Puente, 2014)
- ......

Problematic Phone Use when Driving

❑ **The tendency does not stop when stepping into a car to drive**

- Impact of visual, cognitive, and manual distraction on safety (Caird et al., 2014; 2018; Lee et al., 2009)
- Prevalence of cell phone activities (Oviedo-Trespalacios, 2018; Hallett et al., 2011)
- Association between cell phone engagement and crash risk (Atwood et al., 2018)

❑ **Why??**

- Risk perception, impulse control, difficulty with delaying gratification
- Social norms, a desire to connect socially
- Overconfidence, boredom, under stimulation
- Attachment, dependence,
- ……

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Existing Efforts not Enough

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❑ Solutions?? Ways to detect and mitigate distraction via

- Technological means, such as cell phone blocking technology (Caird et al., 2014; Kashevnik et al., 2021; Leipnitz et al., 2022); but drivers find ways to get around
- Legislative efforts to regulate the use of cell phones and other electronics by drivers; some studies find short-lived positive impact of the laws (Lim & Chi, 2013; Rocco & Sampaio, 2016), others find no evidence of change (Highway Loss Data Institute, 2009; McCartt & Geary, 2004)
- Educational efforts, such as school-based and awareness campaigns and pledges; most studies show limited effect (Joseph et al., 2016)

❑ The effect is inconclusive; need long-lasting, effective, and sustainable programs and campaigns and the associated messaging and framing for behavior change

A New Framework

❑ **The Social Needs and Perceived Support**
- One of the key psychological functions of cell phones or smartphones is its social function in the sense of fulfilling needs of belongingness regardless of physical place and building up social networks and connection to the world outside (Srivastava, 2005; Przybylski & Weinstein, 2013; Verduyn et al., 2017)

❑ **Habitual Use and Attachment**
- Smartphones have been described as having characteristics of an attachment bond: as digital companions (Carolus et al., 2019), digital pacifiers (Diefenbach & Borrmann, 2019; Melumad & Pham, 2017), forms of gratification (Fullwood et al., 2017), social entity (Carolus et al., 2019; Srivastava, 2005), reward mechanism (Aranda & Baig, 2018), and virtual friends (Fullwood et al., 2017)

Data Collection via Online Survey

❑ **An online anonymous survey via Qualtrics on Mechanical Turk**
- Amazon Mechanical Turk Master (Lovett et al., 2018)
- Adults with residence in the US
- Data collected during the beginning of COVID-19 in 2020

❑ **Key Measures**
- The Need to Belong Scale (Baumeister & Leary, 1995)
- The Fear of Missing Out Scale (Przybylski et al., 2013)
- Perceived Attachment to Phone Scale (Weller et al., 2013)
- Habitual Smartphone/Internet Behaviour Scale (Limayenm et al., 2003; van Deursen et al., 2015)
- The Self Regulation Scale (Diehl et al., 2006)
- The Boredom Proneness Scale (Farmer & Sundberg, 1986; Vodanovich et al., 2005)
- Frequency of phone use and application use while driving; hours using Information and Communications Technology in a typical day
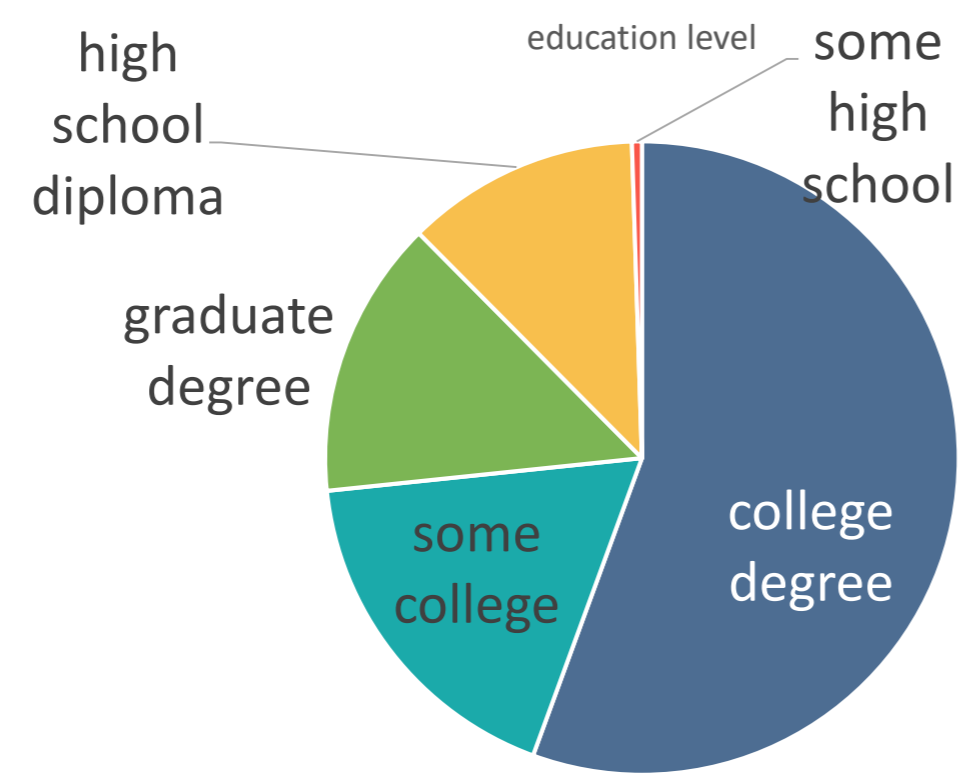
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Sample Characteristics

❑ N = 394 (initially 402, but 8 failed the attention check questions)

- 219 men and 175 women
- Ages ranged from 20 to 76, with the average being 40.89 (SD = 11.21) years
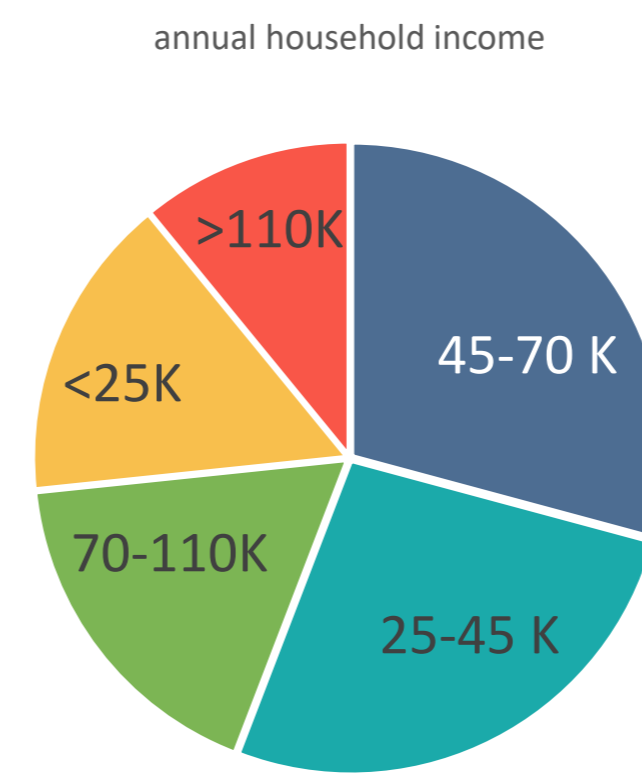- Participants came from 45 states (no data came from Alaska, Arkansas, North Dakota, South Dakota, and Vermont)

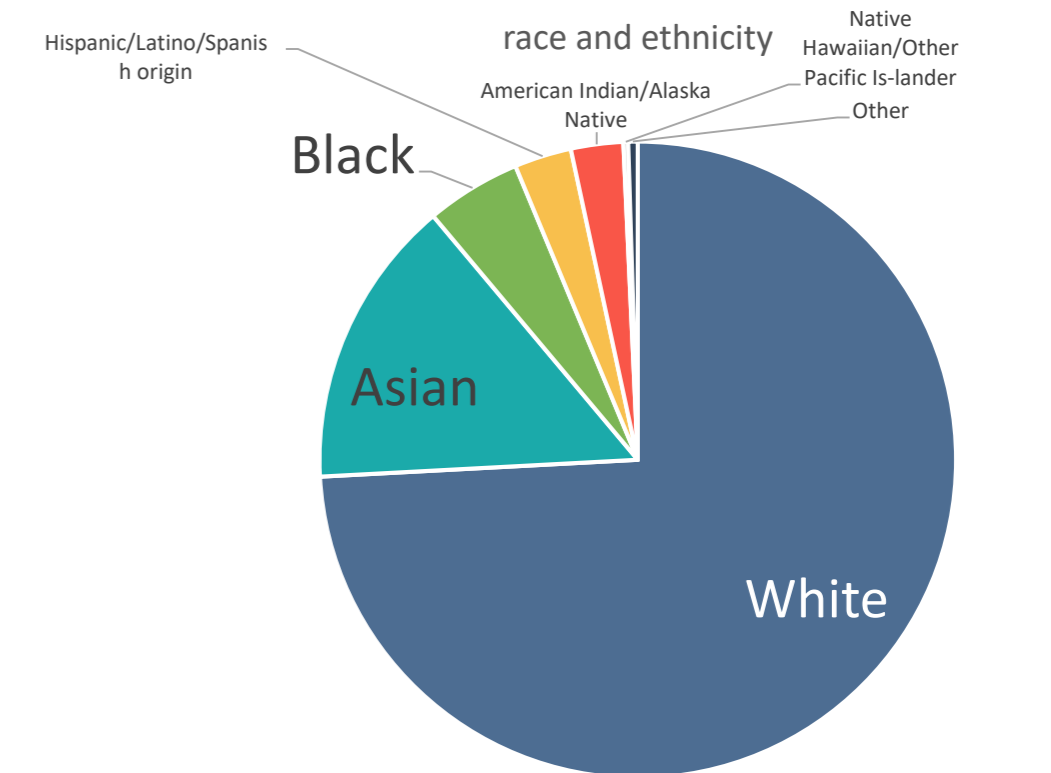❑ Overall, this sample was primarily white, educated, and employed
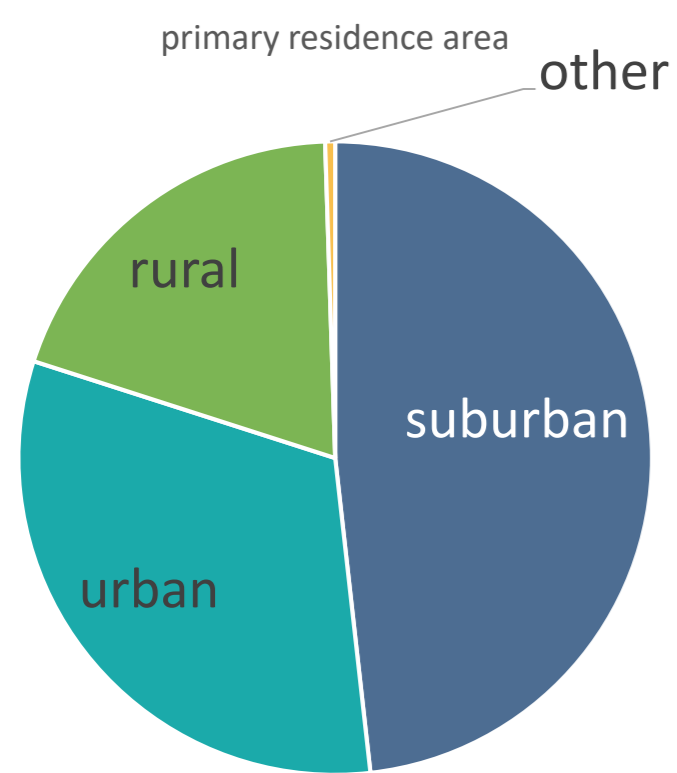
Statistics of the Psychosocial Scales

Scales	Mean	SD	Cronbach's Alpha
Need to belong	26.77	7.93	.88
Fear of missing out	20.28	8.18	.91
Perceived attachment to phones	15.80	5.51	.87
Habitual smartphone/internet behavior - Smartphone	27.45	7.39	.95
Habitual smartphone/internet behavior - Internet	31.96	3.52	.80
Self regulation	31.06	6.03	.90
Boredom proneness - Lack of internal stimulation	30.95	6.01	.81
Boredom proneness - Lack of external stimulation	20.12	7.20	.81

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Structural Equation Modeling

❑ lavaan package (Rosseel, 2012) in R (version 4.2.1) was used
- Measurement model, using confirmatory factor analysis
- Structural model
- Use modindices for identifying residual correlations
- Direct and indirect effects

❑ Based on literature –
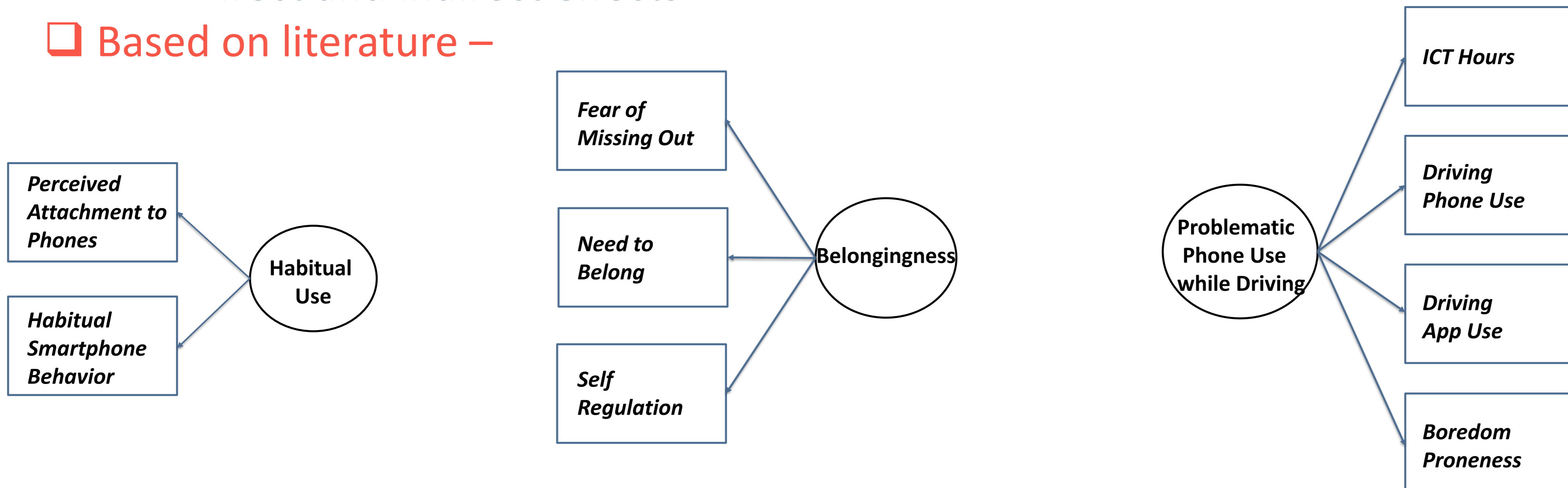
Structural Equation Modeling

❑ Final model
- χ^2 (19) = 27.663, p = .090
- Root Mean Square Error of Approximation (RMSEA) = .034
- Standardized Root Mean Square Residual (SRMR) = .031
- Comparative Fit Index (CFI) = .987
- Tucker-Lewis Index (TLI) = .976

❑ Belongingness has a significant direct effect (p = .018) and a significant total effect (p < .001) on problematic phone use while driving
❑ Habitual use has a significant direct effect on problematic phone use while driving (p = .001)

Structural Equation Modeling

❑ Path diagram
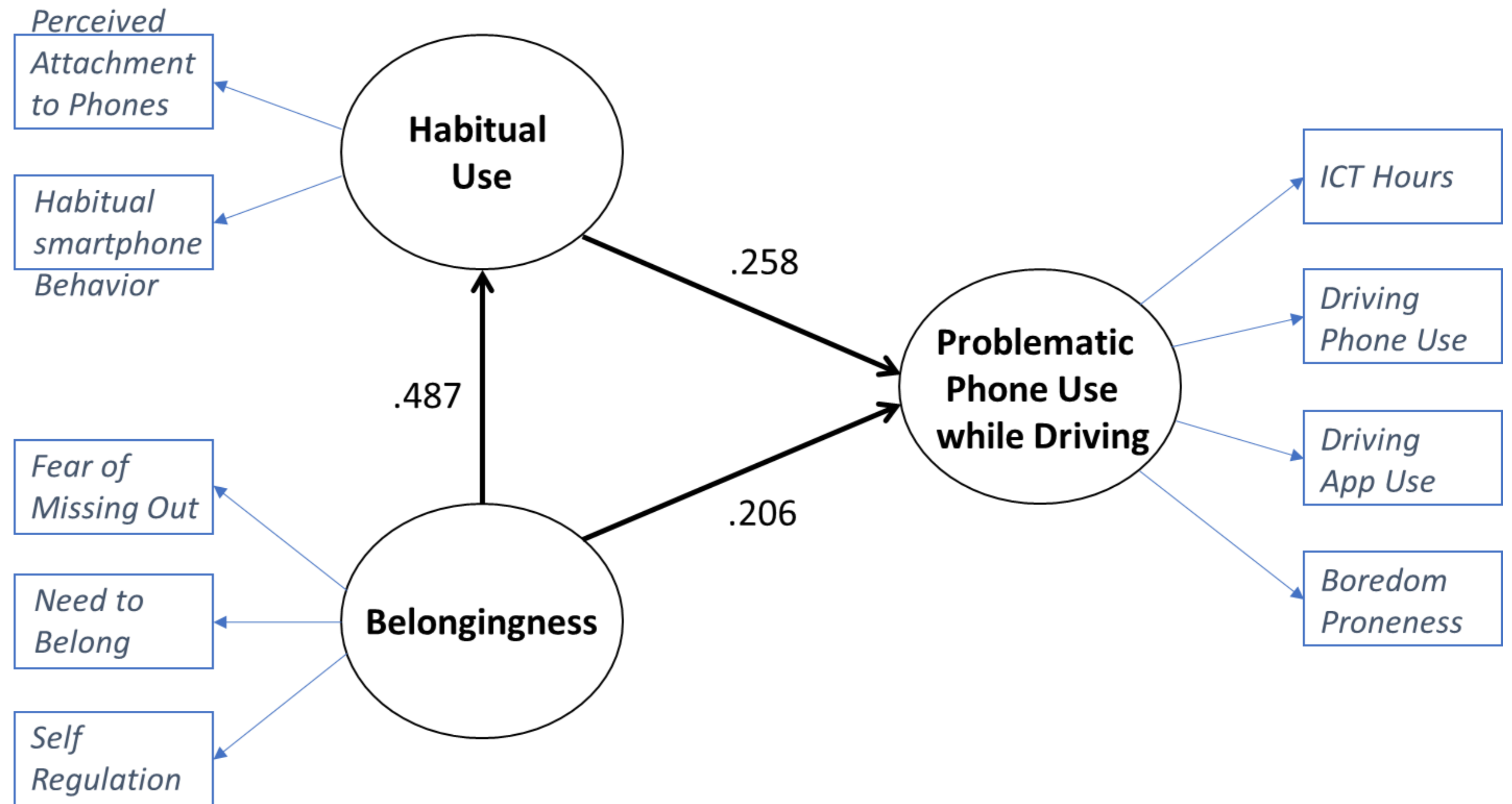
Residual correlations:
FoMO ~~ Boredom
FoMO ~~ ICThours
AppUse ~~ Boredom
NtoB ~~ Boredom
FoMO ~~ SR

Standardized parameter estimates

Summary of Findings and Interesting Observations

❑ Initial evidence that "social" factors play a role; social motivations and habits together lead to problematic use while driving

❑ Better align campaign messaging with target audiences (instead of "It can wait," "Your friends can wait" might be more comprehensively perceived)

❑ Fear of missing out (Matias, et al., 2021) and boredom proneness (Oxtoby et al., 2019; Steinberger et al., 2016) are important variables

❑ Next steps

- Including other factors, such as personality and demographics, to further examine the causal relationship
- Comparing pre-driver, teen drivers, and young adult drivers vs. other adult groups (Who)
- Further looking into the conflict between rational and irrational behaviors (Why)
- The degree to which social changes influence our technology use and adoption (How)

Limitations

❑ Sample was not as diverse as it could be

❑ Participants' attention level was unknown

❑ Based on self-report alone

❑ Data collected during a pandemic

❑ Did not assess any regional safety culture related factors

❑ Did not assess any contextual factors (e.g., driving alone vs. with passengers, day vs. night)

❑ Did not assess any perceived benefits of having a cell phone while driving

❑ Only included several observed variables and three latent variables

❑ Next studies include the exploration of additional variables as well as experimental approaches to further examine the Who-How-Why determinants of distracted driving

Thank you!
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