The advice given in red is what I choose to build upon this literature review. Please make additional changes if suited.

Regards,

**Literature Review of Thesis-Investigating SAS(scale) on Variables**

Smartphones have changed human life significantly owing to the multiple services they offer including facilitated information seeking, entertainment and enhancement of productivity among many others, all while presenting enhanced portability due to their light and compact nature. The pervasive use of smartphones throughout the world is however linked to increasing cases of problematic smartphone use (PSU) – many people use these devices in such a way that it interferes with their daily lives. PSU is linked with some critical hazards such as texting while driving, which has been the cause of numerous accidents, as well as psychopathological issues such as anxiety and depression (Elhai, Dvorak, Levine, & Hall, 2017). This review focuses on previous research surrounding PSU and how it is associated with sleep outcomes and social anxiety. Very concise introduction.

**PSU as an Addiction**

PSU has been termed by many psychologists as an addiction; in fact, PSU is also referred to as ‘smartphone addiction.’ According to the Pew Research Study, 46% of the subjects expressed that they ‘cannot live without their smartphones.’ Many individuals present with heightened anxiety and physical withdrawal-like symptoms when separated from their smartphones (Gao, Li, Zhu, Liu, & Liu, 2016). As a psychological construct, the basis of this addiction is not well understood. It is hypothesized that the addiction arises from a process of negative and positive reinforcement. Addiction models based on negative reinforcement suggest that it arises as a means to cope with negative emotions. Positive reinforcement models suggest that people become addicted by first enjoying the benefits of the substance, before beginning to crave it. Both of these models are applicable to descriptions of how people develop PSU and how it starts affecting their psychological states (Elhai et al., 2017. The user firstly develops a habit of regularly checking their phone, which is made easier through the reception of notifications and by setting alerts. Over time, it only takes seeing the phone as a cue to check it. Progressively, the person links their smartphone with psychological constructs, for instance, the reception of notifications may be associated with social reassurance from family and friends. Many other pathways to PSU have been described and the list is exhaustible. Good section and excellent use of references to support your contentions. Good academic style of writing. Just try to develop some linking sentences between sections and state the implications for your own study.

**Social Anxiety and Previous Studies**

Healthy interpersonal relationships are an essential component of physical and psychological health. Many factors hinder effective interpersonal functioning, including social anxiety. Individual experiences with social anxiety manifest as poor quality relationships due to an internal hindrance to build social connections (Gao et al., 2016). In this light, it is important to understand how smartphone use is associated with such psychological constructs owing to increased smartphone usage on a global scale. PSU has been associated with different mental disorders, which often co-occur with the condition including stress, anxiety and depression. Several studies have evaluated the correlation between PSU and the symptoms of anxiety as noted by Elhai et al., (2017). Even so, a cause-dand-effect relationship between PSU and anxiety is yet to be determined. Within the larger context of research on how technology relates with psychopathology, there is some evidence that underlying psychopathological conditions such as anxiety may make the individual more prone to developing PSU (Elhai et al., 2017). People suffering from social anxiety may also use their smartphones to evade potentially aversive emotional content. How psychopathology leads to PSU, supports the negative reinforcement model of developing an addiction. In their attempts to seek reassurance for particular emotional states, these individuals become hooked to their smartphones, depending on them for psychosocial support. Good point

There is also evidence suggesting that increased technological usage may cause some psychopathological states including anxiety. In a longitudinal study among college students, heavy users of social media, mobile phones and computers reported higher levels of anxiety and more prolonged stress (Thomee et al., 2007 as cited in Elhai et al., 2017). It has also been hypothesized that bidirectional relationships exist between PSU and psychopathological states. For example, an anxious individual may constantly use their smartphone in an attempt to evade their negative emotions. Notwithstanding, excessive smartphone use may further expose them to situations, which precipitate their anxiety via social media, thus eliciting further anxiety. Again good section but it is not clear what this has to do with your study. This needs to be stated explicitly.

**Sleep Outcomes and Previous Studies**

Sleep is crucial for the health and well-being of people. Sleep deprivation has been proved to have an overwhelmingly negative impact on a person’s physical, social and psychological health. Sleep deprivation leads to disruption of the circadian rhythm, which further disrupts the sleep pattern as well as causing different endocrine, metabolic and immune responses. Chronically, this may precipitate complications including hypercortisolism, hypertension and insulin resistance (Adams, Daly, & Williford, 2013). Psychologically, sleep deprivation also precipitates negative behavior such as alcoholism and drug abuse. Daytime sleepiness can also predispose affected individuals to injury since they are more likely to be involved in accidents, which may be fatal at times. Poor sleep also affects cognitive capacity and is associated with reduced short-term memory, decreased motor performance and reduced productivity.

PSU has been linked with the development of sleep problems. This situation is worse among teenagers who are more likely to stay up at night on their smartphones (Randler et al., 2016). Smartphone screens emit blue light, which is picked up photoreceptors in the eye, which when transmitted, is interpreted as daylight by the brain (Randler et al., 2016). As a result, the use of smartphones during sleep time is likely to prolong the sleep latency, because blue light suppresses the secretion of melatonin, which controls the circadian rhythm. A study at the Rensselaer Polytechnic Institute asked the participants to use electronic tablets 2 hours before going to sleep. People who used the tablets while wearing orange goggles, which filter the blue light, had higher levels of melatonin than the other group and had shorter sleep latency than the other group (Adams, Daly, & Williford, 2013). Excellent referencing

Many researchers have investigated the correlation between smartphone usage and sleep outcomes. In the eHeart study, 653 participants installed an application to record their total daily screen time during a 30-day period. People who had higher total screen times were more likely to have poorer sleep outcomes than others. People who use their smartphone at night are also more likely to have poorer sleep outcomes (Adams, Daly, & Williford, 2013). Being a comparative study, it could also be that these people use their smartphones at night, because they cannot sleep due to some other inherent condition. Nonetheless, even in such people, the use of the smartphone further messes up their circadian rhythm, making it more difficult for them to fall asleep than if they had not been using them in the first place. A peer-reviewed investigation among Massachusetts seventh graders found that young children who have a higher screen-time were more likely to report receiving insufficient sleep in the preceding week. This is contributed by the children sleeping next to their phones and thus constantly checking their notifications throughout the night. They also tend to resume using their phones as soon as they wake. Clearly, PSU could affect the multiple facets of healthy sleep. Very good review of the literature

**Gap in the Literature**

Most of the previous research done on the impact of PSU have focused on specific interrelated concepts such as psychopathological states (depression, anxiety, low self-esteem, stress) or sleep outcomes independently. Smartphone use is ascertained to be a reliable indicator of the particular psychological features of an individual. As mentioned earlier, different studies have also focused on how smartphone use affects sleep outcomes. Even so, no study has been conducted that focuses intently on the impact of smartphone use on social anxiety and sleep outcomes.

Focusing on these specific constructs will provide deeper insight into their nature and how they are linked to smartphone use. This investigation may further shed light on the relationship between social anxiety and sleep outcomes and how this relationship is influenced by smartphone usage. Sleep quality is also a multifaceted concept thus demanding deeper inquiry on the effects of smartphone use regarding different aspects. Many studies have focused solely on the effect of smartphone use on sleep latency and sleep disturbances. However, this study intends to investigate how smartphone use affects the use of sleep medication, sleep duration and daytime sleepiness amongst many other phenomena to realize a comprehensive picture of smartphone use on sleep. Very ambitious and I am not sure that you will be able to achieve this with the current data collection tool you have developed.

**Measuring Concepts**

**Smartphone Addiction Scale**

The nature of this research will require the examination of the degree of smartphone use among the participants. A quantitative tool should be used to facilitate the realization of appropriate conclusions regarding the association between smartphone usage and the targeted variables. The researchers intend to use the Smartphone Addiction Scale (SAS), which is a 33-item questionnaire that evaluates the extent of smartphone addiction in subjects. The items in the questionnaire are divided according to the six factors that they assess: positive anticipation, withdrawal, daily-life disturbance, overuse, tolerance and cyberspace-orientated relationships (Kwon et al., 2013). Daily life disturbances entail missing work, difficulty concentrating, suffering from blurred vision and pain in the wrists. The underlying reasons, which cause such disturbances are well understood. Positive anticipation involves the users being excited about using their phones in order to relieve stress. Withdrawal involves users becoming fretful and finding it difficult to cope without having their smartphones close by or preferably, in their hands. Overuse refers to the irrepressible use of smartphones, such as that the person who uses it to perform unnecessary tasks such as conducting unnecessary online searches, constantly charging the phone, and an urge to use the phone right after stopping. Tolerance is the attempt to control one’s smartphone use, but constantly failing to do so. Cyberspace-orientated relationships entail a feeling that one’s online relationships are more stable and fulfilling than those found in ‘real life.’

The evaluation of these factors is constant with evaluation of internet addiction, making the scale most appropriate for determining a quantitative value regarding the extent of smartphone addiction. Even so, being a self-report questionnaire, the data may be inaccurate due to possibilities of false reporting by the respondents. A more efficient method suggested was obtaining the data directly from people’s mobile phones by requiring participants to download an application onto their phones, which enable the researchers to access their smartphone use directly and transmits the relevant data for subsequent analysis (Gao et al., 2016). This method has been used severally in other investigations. Despite the added advantage, this method requires the use of a vast amount of resources, which are not readily available for this investigation.

**The Pittsburg Sleep Quality Index**

The Pittsburg Sleep Quality Index (PSQI) is a 19-item questionnaire assessing the subjective sleep quality over the preceding one month. These 19 items are aggregated into 7 component scores, which are weighted from 0-3. These component scores are summed up to obtain a final sum, which ranges from 0-21, with a higher score being an indicator of poorer sleep quality. The PSQI has been used as a subjective measurement for sleep quality in several studies aimed at evaluating sleep quality owing to its high sensitivity and specificity in the identification of different types of sleep disorders. Buysse et al., (2008) conducted research to determine the correlation between the PSQI and the Epworth Sleepiness Scale, which was the alternative tool for this study. These tools differ significantly in their assessment of sleep quality and obtained different measurements for similar participants. The PSQI was found to be more appropriate for the diagnosis of sleep disturbances, hence its inclusion in this investigation. Nonetheless, high PSQI scores are also associated with the female gender and inherent psychological distress.

**The Interaction Anxiousness Scale**

The Interaction Anxiousness Scale (IAS) is an ideal tool for measuring social anxiety, hence its application during this research. Like the aforementioned tools, it is a self-report questionnaire. It contains 15 items, to which the respondent answers on a 5-point Likert Scale. The IAS was developed appreciating that social interactions differ in that they may be guided by antecedent plans, or may be contingent upon the situation. Gao et al. (2016) used the IAS in their investigation to determine the correlation between smartphone use, social anxiety and loneliness. They affirmed the tool’s content and construct validity, as well as its high internal consistency. Excellent description of our scales. Would worry that the overall instrument will be very long.

**Concluding Thoughts**

The digital revolution is credited with having many advantages such as enhanced work productivity and the enhancement of social connections. Even so, it is important to appreciate the detrimental effects of digital devices on aspects of individual health in order to facilitate the formulation of interventions to prevent their occurrence. Smartphones are some of the most widely used devices in the digital era, owing to their lightness and compactness, allowing users to carry them around and use them at their convenience. Even so, the multiplicity of the services offered by these smartphones predispose individuals to become strongly attached to the devices to the extent that it interferes with the other aspects of their lives. PSU is associated with poor health outcomes in affected individuals and is strongly associated with several psychopathological states. Focusing on social anxiety helps to understand its association with PSU. Is it that individuals with social anxiety are more likely to develop PSU than those who do not, or is PSU a contributing factor for the development of PSU? Furthermore to this, excessive smartphone use has been linked with poor sleep outcomes in affected individuals. A deeper understanding of this relationship is therefore necessary to identify those aspects of sleep that are most affected by smartphone use. This will also provide a more elaborate understanding of other factors, which may influence the impact of smartphone use on sleep outcomes, such as gender and age. Not sure how sleep outcomes can be gender and age. You might need to rephrase this last sentence.

You have made a very good start of the literature review. You need to show how each of the points made lead to the development of your research question. You should weave the tread of your study throughout the literature review. This should culminate in a section where you state your research question and/or hypotheses. Excellent writing style and great use of references to support your points.

References

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Very good references