

SENSORY PROCESSING SENSITIVITY: IS BEING HIGHLY SENSITIVE  
ASSOCIATED WITH STRESS AND BURNOUT IN NURSING?

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## **ABSTRACT**

Nursing is a stressful profession with high levels of burnout among employees. Stress and burnout have been studied extensively in nursing, primarily in terms of organizational and social sources, as well as psychological factors. Studies of Sensory Processing Sensitivity (SPS), the trait that increases one's potential to be overwhelmed by certain aversive stimuli both internally and environmentally, has recently provided increased empirical insight into the areas of stress and burnout. However, SPS has not been studied exclusively or expansively within the context of nursing. The present research explores major nursing stressors and burnout levels in nurses that are considered highly sensitive by nature compared to their less sensitive peers. Participants from Facebook, Allnurses, Reddit and a southern Texas hospital were recruited for this study. Sensory Processing Sensitivity was found to be a significant predictor for stress and burnout among nurses. Further significant findings are also discussed.

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## INTRODUCTION

### Literature Review

Nursing is a stressful profession (Charnley, 1999; Healy and McKay, 1999; Heim, 1991; Roberts & Grubb, 2013; Wolfgang, 1988) with high levels of burnout (Khamisa, Oldenburg, Peltzer, & Ilic, 2015; Maslach & Jackson, 1984; Maslach, Leiter & Jackson, 2011; Renzi, Di Pietro & Tabolli, 2012). Research has focused on these two prevalent problems within the field of nursing since the 1970's (Maslach & Jackson, 1984; Maslach, Leiter & Jackson, 2011). The sources of burnout for nurses have largely been identified as social (i.e., absence of fairness) and organizational (i.e., work overload) in nature. Dispositional variables such as the Five Factor Model (FFM) personality types have also been researched within the context of nursing to gain a deeper understanding of their impact on chronic stress (Alarcon, Eschleman & Bowling, 2009; Cañadas-De la Fuente, Guillermo, Vargas, San Luis, García, Cañadas & De la Fuente, 2014).

The inclusion of variables such as the FFM personality types has helped this research. However, evidence suggests that the unique and innate personality trait of Sensory Processing Sensitivity (SPS; Aron, 2004) may also provide further insight into this issue (Benham, 2006; Kjellgren, Lindahl & Norlander, 2009; Lindsay, 2017; Roberts & Grubb, 2013). Individuals who have the SPS trait, or Highly Sensitive People (HSP; this abbreviation may also refer to the term Highly Sensitive Person; HSPs refers to the plural form of Highly Sensitive Person) are those who can become easily overstimulated by internal and external stimuli due to certain physiological processes within the brain, resulting in heightened emotional reactions and potential behavioral difficulties (Acevedo, 2014; Aron &

Aron, 1997; Jagiellowicz, Xu, Aron, Aron, Cao, Feng & Weng, 2011). Research has also shown that HSPs tend to find novel, complex, unpredictable or highly intense stimuli as aversive (Aron & Aron, 1997). Overwhelming or aversive stimulation can lead to increased stress, placing this group at greater risk for occupational stress and burnout (Cooper, 2014; Jaeger, 2004; Lindsay, 2017).

Although the presence of SPS and its underlying mechanisms have been well established, the field of nursing has yet to be largely and exclusively studied through this lens. Noticeably, there have only been a few other studies to date that have examined this trait within the organizational setting (Cooper, 2014; Evers, Rasche & Schabracq, 2008; Jaeger, 2004; Lindsay, 2017). Among these, the measurement of both stress and burnout among HSPs is contained in even less of them. Furthermore, emotional exhaustion, one of the three dimensions of burnout, has been found to be a main driver in this relationship. There is also a likelihood that other dimensions of burnout may be linked to stressful professions such as those within the context of nursing. Thus, it seems prudent to investigate SPS on a more expansive scale to gather focused information on how this trait is related to nurses as a whole. Therefore, this study compares stress and burnout levels in HSPs working as nurses to stress and burnout levels experienced by their less sensitive peers.

### **Stress in Nursing**

The nursing profession has been ranked by the US National Institute as one of the top 40 most stressful careers to have (Heim, 1991). Out of a study among physicians, pharmacists and nurses, Wolfgang (1988) found that nurses ranked the highest in stress levels by a significant degree. Research by the American Nurses Association (ANA) revealed that

nurses ranked being overworked and the effects of stress as the most serious concerns in their profession; this has not changed in nearly a decade (Roberts & Grubb, 2013). In general, major sources of stress for nurses are heavy workloads (Adeb-Saeedi, 2002; Helps, 1997; Hipwell, Tyler & Wilson, 1989; Khamisa et al., 2015; McNeely, 1995; Roberts & Grubb, 2013; Tyler, Carroll & Cunningham, 1991), being unable to meet the needs of patients (McNeely, 1995) and patient deaths (Hipwell, Tyler & Wilson, 1989; Tyler, Carroll & Cunningham, 1991), with heavy workloads clearly being rated the most frequent and intense stressor of all. According to Gray-Toft and Anderson (1981*a*), the top three nursing stressors from most frequent to least frequent are workload, inadequate preparation, and death and dying. Increased stress has been found to be significantly related to both staff turnover and decreased job satisfaction among hospital nurses. Mental health problems due to stress in nursing have been linked to poor nurse-to-physician communication, negative patient outcomes and medical errors (Khamisa et al., 2015).

In terms of demographics, being over 40 years of age has previously shown to be significantly associated with increased stress levels among nurses (Chen et al., 2009). Additionally, nurses with over 20 years of experience have also been shown to be at increased risk for stress. Some sex differences among nursing and stress have been noted as well in previous literature. These findings include increased co-worker or senior figure conflict for females and lack of resources for males (Solanki, Parmar, Parikh & Vankar, 2015), as well as more stress in general for female nurses compared to male nurses (Adeb-Saeedi, 2002).

### **Burnout in Nursing**

In determining the quality of patient care, a critical focus is the emotional state of nurses (Maria, 2012). According to one study, burnout accounted for the largest explanation of mental health as well as physical health difficulties of nurses. Cooper, Dewe and O'Driscoll (2001) describe burnout as the result of being exposed to stressful working circumstances for a protracted period of time, reflecting a state of both emotional and physical exhaustion. According to Maslach and Jackson (1982), burnout is considered a final product of chronic job stress. Burnout is divided into three dimensions: Emotional Exhaustion (EE), Depersonalization (DP) and low Personal Accomplishment (PA). EE occurs when one's emotional resources become drained and he or she feels as if there is nothing left on a psychological level to offer to others. This dimension is said to be the primary or most reliable marker of burnout that one experiences due to chronic stress. DP refers to feelings of negativity and cynicism concerning others at work, which can lead one to judge others' troubles as rightfully deserved. Lastly, PA is an aspect of burnout in which the individual intuits that his or her accomplishments are not sufficient for the standards they have for themselves. In turn, this feeling of insufficiency results in the individual negatively evaluating themselves.

Although they are not linked specifically to the nursing profession, six major burnout correlates have been identified as products of job-person mismatch in the workplace; these are classified as organizational and social conditions (Maslach et al., 2012). They are work overload, lack of control, insufficient reward, breakdown of the community, absence of fairness and value conflict. Other correlates, such as personality variables, have also been found to be predictors of burnout in nursing. They include extraversion, conscientiousness,

neuroticism and agreeableness. However, Maslach and Leiter (2008) assert that neuroticism is the only one of the FFM personality types that consistently correlates with burnout in general. Furthermore, Lasalvia et al. (2009) found that frequent face-to-face interaction, perceived control and unfairness, and weak work-group cohesion were also predictors of burnout. Having a longer career has also been attributed to burnout among nurses. Burnout, psychological well-being and job dissatisfaction have been significantly associated with medical errors, patient satisfaction, and patient treatment compliance. Lastly, psychiatric morbidity has also been largely associated with burnout, particularly from emotional exhaustion.

### **Sensory Processing Sensitivity (SPS) / Highly Sensitive People (HSP)**

HSPs make up roughly 20% of any given population (Aron, 2004). The study of HSPs noticeably began in the early 1900s with Carl Jung (Aron, 2004), although he referenced these individuals in a slightly different way, as being particularly sensitive, unusually sensitive (Jung, 1913) or congenitally sensitive (Jung, 1916). According to Jagiellowicz et al. (2011, p. 38), SPS is defined as “a temperament/personality trait characterized by sensitivity to both internal and external stimuli, including social and emotional cues.” The trait of SPS is said to be both stable (Dunn, 2001) and innate (Aron, Aron & Jagiellowicz, 2012; Aron, 2004).

SPS is comprised of four distinct dimensions. First, SPS is characterized by an increased awareness of sensory stimuli. This relates to noticing more subtle features in one’s environment or in one’s self. In one fMRI study, multiple brain areas involving general awareness were noted among HSPs. One of these areas in particular was the insula. This part

of the brain is associated with the integration of various internal stimuli, such as sensuous touch, temperature, thirst, and the need for air. Internal stimuli such as these are also integrated into one's emotional states on a rolling basis, with each passing moment, in order to form a subjective interpretation of current experiences. Increased awareness of external stimuli has been noted as well. One study found that HSPs were more aware of other's moods and emotions after viewing various human faces in picture form. This awareness of others' moods and emotions has been found to be an important feature of having the SPS trait (Acevedo et al., 2014), and is sometimes referred to in the literature as intuitiveness or intuition (Aron, 2004).

A deeper processing of internal and external stimuli makes up the second dimension of SPS. For example, fMRI studies have shown that HSPs had greater activation of SPS-relevant brain areas having to do with the processing of both visual stimuli input as well as information that the brain already has. Furthermore, processing sensory information (via reflection) in a thorough manner can take a considerable amount of time (Aron et al., 2012), particularly if one is taking in all new stimuli, as sensitive persons do, and evaluating them seemingly all at once upon contact. This naturally leads to a moment of inhibition in order to process such information (Jagiellowicz et al., 2011), which is the third dimension of SPS. As a result, when given enough time, more sensitive individuals typically make less mistakes than non-HSPs when making fine discriminations involving environmental stimuli. In addition, sensitive individuals engage in more comprehensive processing of all types of information than non-HSPs on tasks that required fine discrimination of visual subtleties (Aron et al, 2012). A momentary inhibition of behavior, according to Jagiellowicz et al.

(2011), occurs from low-familiarity situations or those generating reactions that are conflicting. In addition, this brief inhibition of behavior allows HSPs to make associations with similar actions taken in the past, as well as project into the future about potential likely outcomes that may result from each action currently being considered (Aron & Aron, 1997).

The fourth dimension of SPS, stronger emotional reactions, allows new experiences or novelty to be experienced on a heightened emotional level so that meaning can be derived in order to make better future or calculated behaviors (Baumeister, Vohs, DeWall & Zhang, 2007). In the same vein, after learning of and deriving the meanings for greater advantage in similar detectable future scenarios, one also learns to respond more quickly, and with more automated affective responses. Generating meaning from these special experiences due to heightened emotional reactions also stimulates increased memory utilization. The biological explanation for heightened emotional reactivity is that it increases survival by drawing attention to possible dangers in a stressful environment (Aron, Aron & Jagiellowicz, 2012).

### **Gray's Model and SPS Theory**

Gray's model, which has been meticulously linked to biopsychological processes, posits that there are two systems in the brain that cause the most foundational differences in personality in humans (Aron & Aron, 1997). The first is the Behavioral Activation System (BAS), which is postulated to be sensitive to both punishment and reward, is mainly focused on stimulating or alerting responses, such as those derived from catecholamine release. This system is not particularly active in introverts, but is more active in extroverts (Aron & Aron, 1997). The second is the Behavioral Inhibition System (BIS). This is said to be the most active in HSPs when compared to non-HSPs. In comparison to the BAS, the BIS is said to be

sensitive to punishment as well. The BIS contrasts with the BAS in that it is sensitive to novelty and non-reward. According to Gray (1981; 1985), the main purpose of the BIS is to compare present and past experiences, and a momentary inhibition of behavior is created when there is a fear of punishment.

SPS theory asserts that the initial response of inhibition in the brain is actually caused by reflectivity and not fear (Aron & Aron, 1997). This is the key difference between SPS theory and Gray's model of personality. The SPS theorists make the claim based on their study's findings that not all introverted individuals are highly sensitive, and not all HSPs are introverted. Based on the assertion that inhibition is caused by reflectivity for HSPs, Aron and Aron (1997) write that this group has "a preference for input over output," and a special ability for "retrospective and prospective reflection about consequences," by taking new information and comparing it to past experiences and also projecting potential or likely scenarios into the future (p. 349).

SPS theory also asserts that HSPs generally display slower response sets than introverts due to the need to reflect first before any inhibition of behavior occurs. Thus, the more aroused an HSP becomes to new stimuli or situations, the slower their response time would become. This is due to the need to deeply and subtly process the details of new information received through any of the five visual, auditory, olfactory, sensory or tasting senses- which happens more easily in HSPs because of increased BIS activation. The BIS is mostly involved with the frontal cortex and the right hemisphere of the brain, and fMRI studies have confirmed this (Aron, Aron & Jagiellowicz, 2012). These regions are responsible for deep processing of information as well as reflectivity in persons with SPS.

This also could result in delayed responses to new situations. In particular, the septohippocampal system is the main part of the BIS and allows for reduced impulsivity (Aron & Aron, 1997).

### **SPS and its Uniqueness from Introversion and Negative Emotionality**

SPS has been fundamentally confused in the past with some major personality models or properties, particularly those containing introversion and emotionality/neuroticism (Aron & Aron, 1997; Aron et al., 2012; Smolewska, 2006). As a result, moderate significance has unsurprisingly been found among SPS and these personality variables. In a series of studies, Aron and Aron (1997) tested the distinctness and discriminant validity of SPS against measures of the Big Five Personality Inventory (BFI), which measures the FFM, by creating an alternative measure of sensitivity. They found that 71% of the variance could not be explained by all five BFI properties, and after controlling for introversion and emotionality together, SPS was still significant. They also independently and collectively controlled for introversion and emotionality in another study using the Myers-Briggs Type Indicator instrument. Here, Aron and Aron (1997) were still able to find significance between SPS and most of the items in the alternative measure of sensitivity.

fMRI studies have also shown areas in the human brain distinct to SPS and separate from introversion and emotionality (Jagiellowicz et al., 2011). In addition, one study found that after controlling for neuroticism, SPS was significantly correlated with more than twelve distinct areas of the human brain (Acevedo et al., 2014). These findings also showed that SPS-related areas were mostly found in the right side of the brain.

An estimated 70% of HSPs are said to be introverted while the remaining 30% are

extraverted (Aron, 2004). This further supports the partial independence of SPS from introversion or extraversion. In addition, while 70% of HSPs are considered to be introverts due to overstimulation, multiple sources of literature state that there are also sensitive people that are introverted due to other reasons, such as previous negative experiences or avoidant attachment styles (Bowlby, 1969; Cassidy & Shaver, 1999). Lastly, several researchers have noted the trait of sensitivity in nature. Responsivity, plasticity, or flexibility (similar to SPS; Wolf, Van Doorn & Weissing, 2008) have been observed in over 100 other species (Koolhaas, Korte, De Boer, Van Der Vegt, Van Reenen, Hopster, et al., 1999; Verbeek, Drent & Wiepkema, 1994; Wilson, Coleman, Clark & Biederman, 1993).

### **Difficulties Among Highly Sensitive People (HSP)**

Research suggests that due to increased sensitivity in processing information, HSPs are at increased risk for mental and physical health difficulties (Benham, 2006; Siegel, 2007; Jawer, 2005; Bakker & Moulding, 2012). Also, research reveals that a relationship exists between SPS and higher stress levels (Benham, 2006), and the preoccupation of applying meaning to incoming stimuli and social cues was shown to correlate to anxiety over both past and potential events (Siegel, 2007). Reported problems among HSPs include anxiety, depression, insomnia, attention deficits, headaches, chronic pain and fatigue, social phobia, decreased libido, decreased memory, high blood pressure, irritable bowel syndrome, various gastrointestinal problems, skin problems, allergies and asthma (Jawer, 2005). Lindsay (2017) found in an occupational study of HSPs as teachers (another stressful profession) that not only were HSPs at increased risk for stress, they were at increased risk for emotional exhaustion as well. Bakker and Moulding (2012) claim that high SPS individuals will

become depressed more easily if they experience continued emotional setbacks, have low social resources and get overwhelmed easily by external stimuli, all of which lead to withdrawal.

### **SPS, Stress & Burnout in the Nursing Profession**

Past literature has noted that HSPs and nurses are at increased risk for stress (Benham, 2006; Evers, Rasche & Schabracq, 2008; Kjellgren, Lindahl & Norlander, 2009; Roberts & Grubb, 2013). According to SPS theory, HSPs are particularly sensitive to various kinds of stimuli, including too much social stimuli or stimuli from the moods of others, strong smells, bright lights, loud noises or new or changing situations (Aron & Aron, 1997; Acevedo et al., 2014; Jagiellowicz et al., 2014). Due to this, events can be experienced by HSPs as overwhelming, aversive and consequently stressful, especially in already stressful or non-supportive environments (Aron & Aron, 1997). Based on this reasoning, the following hypothesis is presented:

H1: SPS will be a significant predictor of overall nursing stress.

Research also reveals that HSPs naturally take longer to process new information or any stimuli that involves many details. If the amount of workload is increased by too much, this will overwhelm the HSP. As a result, the HSP will become more frequently inhibited in taking note of any new information. However, if the HSP's delayed responses (to process information more thoroughly and to avoid making mistakes) result in an inability to keep up with the current job demand, this will be perceived as aversive, as too much stimuli presented in too short of a time frame for the HSP tends to overwhelm them. The tendency to be overwhelmed by aversive stimuli is one of the hallmarks of SPS. Due to this, the following

hypothesis is proposed as it relates to nursing workload:

H1a: SPS will be a significant predictor of workload-related stress.

Providing emotional support is important in nursing, particularly with patients and their families. SPS has been previously linked to higher empathy (Cooper, 2014). However, the nurse must feel as if they are making a positive or therapeutic emotional impact on the patient and their loved ones. A previous study (Lindsay, 2017) has shown that HSPs experience mostly emotional exhaustion in relation to job stress. This could mean that a nurse who is highly sensitive may experience increased stress if they are unable to meet the essential needs of patients and their respective families. Furthermore, this perception could also be worsened by other job demands, such as other tasks that may result in the nurse feeling that they are too busy to spend the time needed for less time-related concerns, such as emotional support. Lastly, HSPs experience heightened internal emotions (Aron & Aron, 1997), and they are particularly perceptive with the cues of others, especially negative moods (Cooper, 2014). If the nurse who is highly sensitive perceives that they cannot assist in the positive emotional outcome of patients' concerns, then experiences such as these may also be stressful. Thus, the following hypothesis is proposed:

H1b: SPS will be a significant predictor of stress due to inadequate preparation.

Any frequent and intense stressors experienced would only compound the likelihood for burnout to occur in the workplace among HSPs as nurses, as previous research has noted that burnout is the final product of chronic job stress (Cooper, Dewe & O'Driscoll, 2001; Maslach & Jackson, 1997). Evidence also shows that nurses are significantly at risk for burnout (Khamisa et al., 2015; Renzi et al., 2012), while there is also research that suggests a

likelihood or risk of burnout among HSPs in the workplace (Lindsay, 2017; Cooper, 2014; Jaeger, 2004). Thus, the following hypothesis is proposed as it relates to overall burnout in HSPs as nurses:

H2: SPS will be a significant predictor of overall burnout in nurses.

A previous study has found that EE was predicted by SPS (Lindsay, 2017). Furthermore, the Lindsay (2017) study examined the helping occupation of teaching that has been previously deemed as stressful. Nursing has also been deemed as stressful, but it is also a helping profession, like teaching, although the outcomes of each profession clearly differ. In addition, EE is expected to be the most significant part of any burnout dimension that is found. Thus, the following hypothesis on EE is proposed:

H2a: SPS will be a significant predictor of EE in nurses.

The Lindsey (2017) study did confirm SPS as a significant predictor of EE among another stressful occupation (teaching), and the sample size was only 25 among its participants. Since this is the case, it is suspected that other or all dimensions of burnout may be significantly related to SPS when examined in a much larger sample. However, it is unclear which dimension(s) might be related. Therefore, the following research question is proposed:

RQ1: Does SPS share a statistical relationship with DP and/or PA, and if so, what is the nature be of such relationship(s)?

## METHOD

### Participants

461 participants from a southern Texas hospital as well as dedicated online nursing forums or groups from the websites Facebook, Reddit and Allnurses took part in the study. Each of these online platforms exists solely to facilitate communication between fellow RNs and/or LVNs and LPNs. Permission was requested from each administrator of his or her respective platform to insert the study information and a survey link inside their forum. Through Qualtrics, an online survey construction and distribution platform, all participant sources were kept confidential. No incentive was offered for participating in the study. Cases were only included if at least some form of direct patient contact existed concerning the physical care of patients. For example, respondents in utilization review and quality control specialty areas were excluded due to this particular criterion. After data screening and eliminating non-hospital nursing cases, 252 nurses remained for the final sample. Most case deletions were due to participant dropout and non-hospital nursing participation (e.g., school, corrections, etc.).

Of this total, 217 were female (average age = 34.73, *SD* = 10.87) and 35 were male (average age = 32.80, *SD* = 8.74). For race/ethnicity, 214 were Caucasian/European American, 10 were Hispanic/Latina/Latino, 12 were Bi-racial/Multi-racial/other, 8 were African American/Black, 6 were Asian/Asian American/Pacific Islander, and 2 were Native American/Alaskan Native. Of the highest licensure level for nurses, 236 were Registered Nurses (RNs) and 16 were Licensed Vocational or Practical Nurses (LVNs/LPNs).

Of the current nursing specialties, 72 were medical-surgical, 55 were Intensive Care

Unit, 30 were Emergency Room, 22 were long term care or acute care rehab, 20 were from Intermediate or Stepdown units, 16 were Labor & Delivery and Obstetrics, and 14 were from Psychiatric inpatient floors. In addition, 9 were of other concentrations that yielded smaller sizes on their own, so these were consolidated (Operating Room, Oncology, Post-Anesthesia Care Unit).

In terms of highest education level, 68 had an associate degree, 155 had a bachelor's degree, 11 had a master's degree, one had a post-master's certificate, and 17 were other. Out of 252 cases, the average years of nursing experience was 5.56, with a range of 0.25 to 46 years. The mode for years of nursing experience was one year, with a sample size of 55 in this bracket. Out of 252 cases, the average years in current specialty was 3.86, with a range of 0.25 to 30 years. The mode for years in current specialty was one year, with a sample size of 81 for this bracket alone.

### **Procedure**

After consenting to partake in the study, a skip logic qualifier question was introduced promptly that asked whether participants are currently working in the United States as either a Registered Nurse (RN), Licensed Vocational Nurse (LVN) or Licensed Practical Nurse (LPN). If respondents answered no to this question, they were forwarded to the end of the survey without participating. After this, one demographic survey and four measures were administered in the following order: demographics, BFI-2-S, HSPS, NSS and the MBI-HSS. In addition, one manipulation check question was embedded about a third of the way into the study. This question asked participants, "For this statement, please mark neutral." If this question was answered incorrectly, the entire case was deleted from the data

set. The total number of questionnaire items included in this study was 107.

## **Measures**

First, participants completed the demographics questionnaire. Demographic information included age, sex, race/ethnicity, years of nursing experience, current specialty, “Does your job involve direct patient care?”, years in current specialty, education level and highest licensure level.

**Big Five Inventory-2-Short Form.** Next, participants completed the Big Five Inventory-2-Short form (BFI-2-S), which measures personality facets (Soto & John, 2017). The facets include extraversion (6 items), agreeableness (6 items), conscientiousness (6 items), negative emotionality (6 items) and open-mindedness (6 items). The response format is a Likert scale, from 1 (Disagree strongly) to 5 (Agree strongly). The BFI-2-S form has been shown to retain about 90% of the BFI-2 form's domain scales' reliability, external validity, and self-peer agreement. The BFI-2 form's original alpha reliabilities of the domain scales average about .86, ranging from .81 to .90 across three separate samples. In the present study, the average Cronbach's Alpha reliability among the subscales was .74. Individually, extraversion reliability was .74, agreeableness was .72, conscientiousness was .71, and negative emotionality was .84. Open-mindedness was .70. The personality scores collected were used as covariates. This shorter 30-item measure was given for brevity purposes due to the high number of items included for this study (107). This measure was the first to be given, after the demographic questionnaire, due to the short length and ease of readability for each survey item, thus making this an acceptable starting measure for reasons of avoiding priming and preventing participant dropout.

**Highly Sensitive Person Scale.** The shortened version of the Highly Sensitive Person Scale (HSPS) was completed after the BFI-2-S. This measure consists of 18 items that assess three subscales of sensitivity: Ease of Excitation (EOS; 8 items), Aesthetic Sensitivity (AES; 5 items) and Low Sensory Threshold (LST; 5 items). EOS is defined by Evers, Rasche and Schabraq (2008) as becoming overwhelmed mentally due to external and internal demands. AES is defined as being aesthetically aware, and LST is described as the type of unpleasant sensory arousal that is caused by external stimuli. The original scale was 27 questions. However, Smolewska, McCabe and Woody (2006) were able to shorten and sub-compartmentalize the scale into three subscales without sacrificing any validity or reliability from the original scale. Cronbach's coefficient alpha for EOE was .77; AES was .71; lastly, LST was .85. Inter-correlations among the subscales were .24 for EOE and AES, .65 for EOE and LST, and .24 for AES and LST. In the current study, Individually, EOE was .83, AES was .74, and LST was .90. The HSPS has previously demonstrated independence from the BFI scale with an unshared variance of 71%, showing that SPS operates mostly within its own definitional parameters.

**Nursing Stress Scale.** After the HSPS, the Nursing Stress Scale (NSS) was presented. The NSS measures the seven major sources of nurse stress (Gray-Toft & Anderson, 1981*a*). The factors include work load (6 items), death and dying (7 items), inadequate preparation (3 items), lack of staff support (3 items), uncertainty concerning treatment (5 items), conflict with physicians (5 items) and conflict with other nurses (5 items). For purposes of clarity, inadequate preparation pertains to not being able to deal with the needs of patients and patient families. The response format is a Likert scale, from 0

(Never) to 4 (Very Frequently) with statements concerning these major sources of stress, such as, “Too many non-nursing tasks required, such as clerical work” and “Conflict with a supervisor.” Test-retest reliability coefficients for 4 out of 7 subscales were in excess of .70. All internal consistency measures surpassed .70 for all components except two subscales. In the present study, Cronbach’s Alpha for total scale was .89. For the subscale of work load, Cronbach’s was .76; death and dying was .79; inadequate preparation was .79; lack of staff support was .88; uncertainty concerning treatment was .76; physician conflict was .69, and conflict with other nurses was .78. Using a stress scale specifically tailored to the hospital nursing population appears to be the most logical choice based on its saliency and how these already established nursing stressors specifically relate to the HSP population. The NSS is geared toward hospital nurses, as it asks about some specific hospital-related instances. For example, two items in the scale were “Lack of an opportunity to talk openly with other unit personnel about problems on the unit,” and “Not enough staff to adequately cover the unit.” Thus, only hospital nurses and nurses that performed work that was highly similar to hospital unit work (specifically long-term care, acute care rehab) were included in the current study.

**Maslach Burnout Inventory.** The Maslach Burnout Inventory for Medical Personnel Survey (MBI-HSS), which consists of 22 items that assess three dimensions of occupational burnout, was last. These dimensions include: Emotional Exhaustion (EE; 9 items), Depersonalization (DP; 5 items) and Personal Accomplishment (PA; 8 items). The MBI-HSS is for those who work in professions with more than occasional contact with patients, including nurses (Maslach & Jackson, 1996). Internal reliability Cronbach’s coefficient alpha estimates for emotional exhaustion yielded .90, depersonalization yielded .79, and personal

accomplishment yielded .71. By measures of discriminant validity, burnout has been shown to be an independent measure and construct. In this study, Cronbach's Alpha for emotional exhaustion was .93; for depersonalization, it was .71, and for personal accomplishment it was .78. These reliabilities averaged together yielded .81.

## RESULTS

### Correlations

Bivariate correlations were conducted on age, sex, years of nursing experience, current specialty, years in current specialty, NSS scores, MBI-HSS scores, HSPS scores and BFI-2-S scores. All correlations are provided in Table 1.

The SPS trait was measured on a continuous scale for the current study, although Aron and Aron (2013) recommended that the construct would be suitable for measurement if dichotomized. The choice to utilize a continuous scale over a dichotomous one was due to the SPS histogram distribution resembling no evident breaks that might reveal any HSP clusters as Aron and Aron (2013) suggested would typically occur upon analysis. Furthermore, the SPS distribution was relatively even and without significant skewness or kurtosis (See Figure 1).

Age was significantly positively skewed (see Figure 2) upon visual inspection. Age was significantly correlated to the NSS subscales of inadequate preparation,  $r(252) = -.19$ ,  $p < .01$ , and conflict with physicians, with  $r(252) = -.19$ ,  $p < .01$  (See Table 1). Age was significantly correlated to the MBI-HSS subscales of EE,  $r(252) = -.12$ ,  $p < .05$ ; DP,  $r(252) = -.15$ ,  $p < .05$ , and PA, with  $r(252) = .15$ ,  $p < .05$ . In addition, age was found to be significantly correlated to negative emotionality and years of nursing experience, with  $r(252) = -.13$ ,  $p < .05$ , and  $r(252) = .75$ ,  $p < .001$ . Age was not found to be significantly correlated to HSPS scores or any other variables.

There was a vastly uneven sample for sex (see Figure 3), with 217 females and 35 males available overall for analyses. Sex was coded (1= male, 2= female). Among dependent

Figure 1  
*Sensory Processing Sensitivity Distribution Scores*

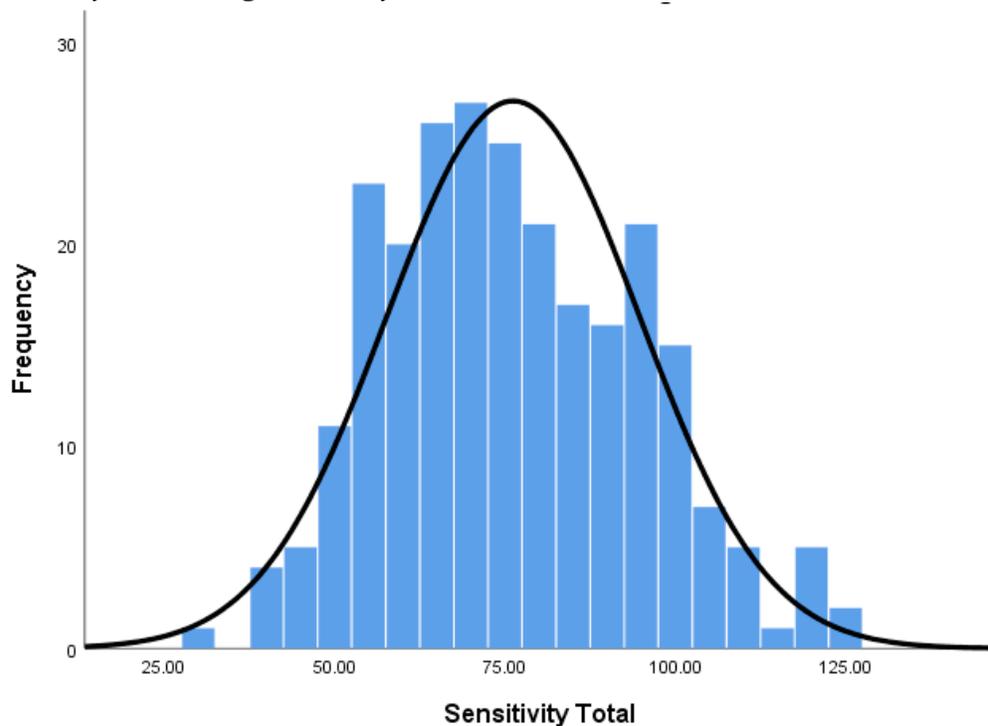


Figure 2  
*Age Distribution of Hospital Nurses*

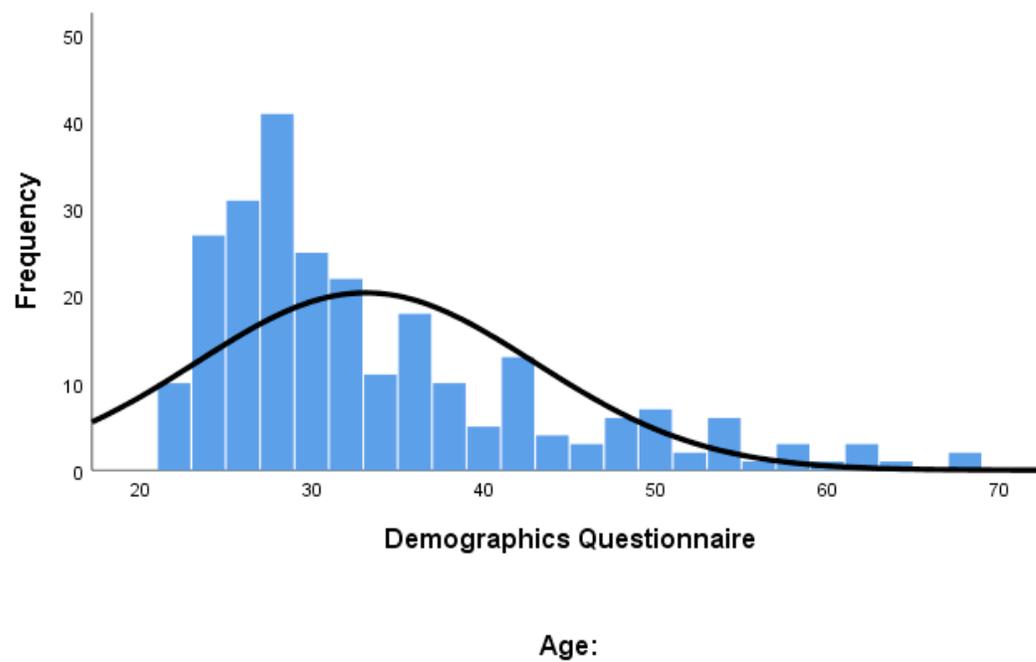


Figure 3  
*Sex Distribution of Hospital Nurses*

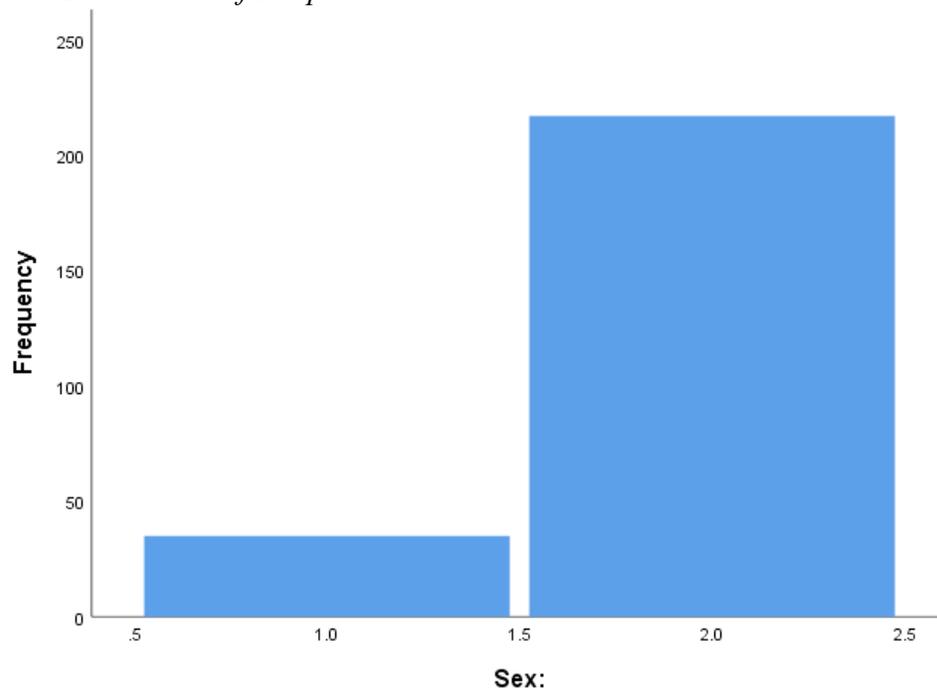


Figure 4  
*Years of Experience Distribution of Hospital Nurses*

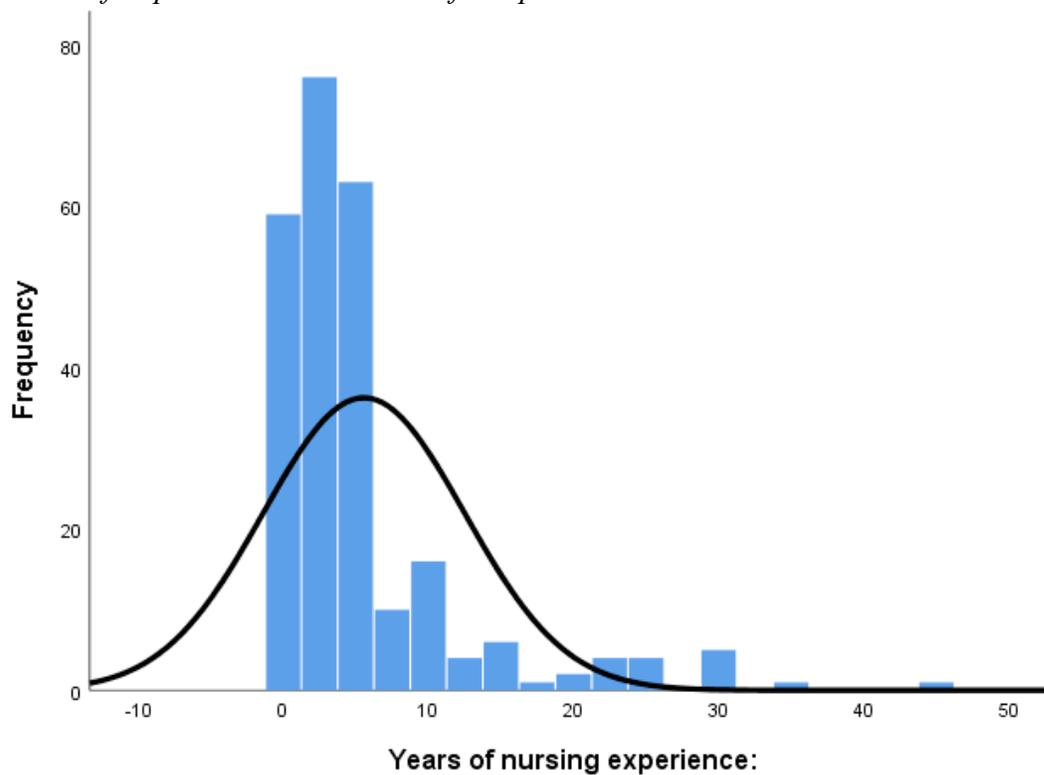


Table 1  
Correlations of Sensitivity, Sensitivity-Related Variables and Stress and Burnout Variables

	1	2	3	4	5	6	7	8	9	10	11	12
1. Sensory Processing Sensitivity Total	(.83)											
2. Ease of Excitation	.89**	(.84)										
3. Low Sensory Threshold	.88**	.67**	(.90)									
4. Aesthetic Sensitivity	.62**	.34**	.37**	(.76)								
5. Nursing Stress Scale Total	.30**	.25**	.29**	.19**	(.78)							
6. Work Load	.26**	.20**	.25**	.19**	.68**	(.77)						
7. Death & Dying	.10	.04	.08	.17**	.64**	.32**	(.79)					
8. Inadequate Preparation	.36**	.37**	.31**	.15**	.57**	.28**	.29**	(.79)				
9. Lack of Staff Support	.26**	.25**	.25**	.09	.57**	.32**	.15**	.34**	(.88)			
10. Uncertainty Concerning Treatment	.17**	.15**	.16**	.08	.79**	.44**	.41**	.43**	.40**	(.77)		
11. Conflict with Physicians	.26**	.25**	.25**	.10	.74**	.34**	.34**	.42**	.27**	.59**	(.71)	
12. Conflict with Other Nurses	.10	.06	.11*	.09	.65**	.34**	.19**	.16**	.39**	.42**	.549**	(.78)
13. Maslach Burnout Inventory Total	.43**	.36**	.38**	.31**	.41**	.46**	.18**	.36**	.23**	.29**	.251**	.184**
14. Emotional Exhaustion	.51**	.49**	.47**	.23**	.46**	.52**	.13*	.39**	.32**	.31**	.322**	.232**
15. Depersonalization	.15**	.14*	.17**	.03	.26**	.22**	.08	.35**	.14*	.23**	.170**	.116*
16. Personal Accomplishment	-.08	-.18**	-.15**	.24**	-.14*	-.08	.10	-.21**	-.18**	.14*	-.162**	-.0105
17. Sex	.21**	.20**	.20**	.07	.16**	.13*	.06	.05	.05	-.13	.225**	0.104
18. Age	-.03	-.07	-.04	.08	-.13*	-.07	-.08	-.27**	.04	-.16**	-.172**	0.029
19. Years of Nursing Experience	-.06	-.06	-.10	.03	-.08	-.09	-.05	-.21**	.07	-.11*	-.097	.114*
20. Extraversion	-.42**	-.51**	-.36**	-.02	-.09	-.01	.08	-.26**	-.13*	-.06	-.116*	-.0553
21. Agreeableness	.11*	.10	-.01	.23**	.03	.04	.11	.01	.06	.03	-.026	-.0099
22. Conscientiousness	-.19**	-.25**	-.22**	.09	.01	.08	.04	-.16**	-.05	.03	0.015	0.009
23. Negative Emotionality	.56**	.63**	.50**	.10	.25**	.16**	.05	.24**	.25**	.15**	.307**	.140*
24. Open-mindedness	.25**	.02	.15**	.60**	.07	.10	.14*	-.05	.01	.01	0.001	0.027

\*\* Correlation is significant at the 0.01 level (2-tailed).

\* Correlation is significant at the 0.05 level (2-tailed).

Alpha scale reliabilities are given in parentheses on the diagonal.

Note. The item "Years of Nursing Experience" was only completed by 215 participants.

Continued, Table 1  
Correlations of Sensitivity, Sensitivity-Related Variables and Stress and Burnout Variables

	13	14	15	16	17	18	19	20	21	22	23	24
1. Sensory Processing Sensitivity Total												
2. SPS: Ease of Excitation												
3. SPS: Low Sensory Threshold												
4. SPS: Aesthetic Sensitivity												
5. Nursing Stress Scale Total												
6. NSS: Work Load												
7. NSS: Death & Dying												
8. NSS: Inadequate Preparation												
9. NSS: Lack of Staff Support												
10. NSS: Uncertainty Concerning Treatment												
11. NSS: Conflict with Physicians												
12. NSS: Conflict with Other Nurses												
13. Maslach Burnout Inventory Total	(.81)											
14. MBI-HSS: Emotional Exhaustion	.85**	(.93)										
15. MBI-HSS: Depersonalization	.70**	.51**	(.73)									
16. MBI-HSS: Personal Accomplishment	.08	-.35**	-.27**	(.78)								
17. Sex	.08	.17**	-.07	-.06								
18. Age	-.13*	-.13*	-.24**	.16**	.06							
19. Years of Nursing Experience	-.16**	-.13*	-.21**	.07	.11	.78**						
20. Extraversion	-.11	-.30**	-.12*	.39**	-.11*	.08	.04	(.73)				
21. Agreeableness	-.00	-.03	-.25**	.26**	.09	.02	-.02	.05	(.70)			
22. Conscientiousness	.00	-.10	-.10	.25**	.00	.04	.01	.30**	.15**	(.72)		
23. Negative Emotionality	.33**	.54**	.16**	-.34**	.22**	-.09	-.07	-.45**	-.05	-.32**	(.85)	
24. Open-mindedness	.14*	.04	-.03	.24**	-.05	.08	.03	-.21**	.19**	.09	-.06	(.69)

\*\* Correlation is significant at the 0.01 level (2-tailed).

\* Correlation is significant at the 0.05 level (2-tailed).

Alpha scale reliabilities are given in parentheses on the diagonal.

Note. The item "Years of Nursing Experience" was only completed by 215 participants.

variables, sex was positively correlated with HSPS scores,  $r(252) = .18, p < .01$  (See Table 1). More specifically, for sex there was a significant positive correlation with both EOE and LST, with  $r(252) = .17, p < .01$ , and  $r(252) = .18, p < .01$ , respectively.

Due to the uneven sample size of sex, a follow-up independent samples T-test was conducted between sex and SPS, with the 35 male cases that were originally available and 35 randomly SPSS-generated cases from the larger original female sample of 217. The analysis revealed significant differences between male SPS total ( $M = 67.80, SD = 18.59$ ) and female SPS total ( $M = 81.91, SD = 17.07$ );  $t(68) = -3.31, p < .01$ . This suggests that females were more sensitive than their male counterparts based on the sampled population. Sex also significantly correlated with nursing stress subscales of uncertainty concerning treatment,  $r(252) = .14, p < .05$ , and conflict with physicians, with  $r(252) = .23, p < .001$ . A follow-up T-test was conducted for sex and NSS, utilizing the same 35/35 sampling of random cases of sex as before and found no significant differences between males and females among six out of seven of the NSS subscales. There was a significant sex difference between male conflict with physicians ( $M = 9.46, SD = 1.98$ ) and female conflict with physicians ( $M = 11.42, SD = 2.87$ );  $t(68) = -3.35, p < .01$ . This indicates that female nurses on average experienced more frequent stress from physician conflict when compared to male nurses.

Years of nursing experience was significantly positively skewed upon visual assessment (see Figure 4), but it was significantly correlated with a few of the NSS subscales, including inadequate preparation,  $r(252) = -.12, p < .05$ , and lack of staff support,  $r(252) = .14, p < .05$  (See Table 1).

The HSPS was significantly correlated with scores of NSS,  $r(252) = .30, p < .001$

(See Table 1). When exploring Research Question 1, bivariate correlation revealed that the HSPS was significantly correlated with MBI-HSS, with  $r(252) = .42, p < .001$ . Both of these findings suggest that nurses higher in sensitivity will experience more stress and burnout in general. Furthermore, the HSPS significantly correlated with five out of seven stress subscales, indicating that HSPs get more stressed than non-HSPs for the most frequently reported stressors in nursing. SPS showed significance with workload, with  $r(252) = .27, p < .001$ ; with inadequate preparation,  $r(252) = .34, p < .001$ ; with lack of staff support,  $r(252) = .26, p < .001$ ; with uncertainty concerning treatment,  $r(252) = .17, p < .01$ , and conflict with physicians, with  $r(252) = .26, p < .001$ . Thus, HSPs appear to correspond most of the frequent nursing stressors (5 of 7) like their less sensitive counterparts do.

In order to answer Research Question 1 further, a bivariate correlation was conducted between the HSPS and the sub-dimensions of burnout. SPS was found to significantly relate to all of the burnout subscales except for PA (See Table 1). This is suggestive of a more comprehensive level of burnout when referring to HSPs in nursing and stressful occupations as compared to the Lindsay (2017) study, which only found one subscale dimension to be significant. EE was strongly correlated, with  $r(252) = .52, p < .001$ . This was expected, as a high-moderate correlation of .48 was found in a previous occupational study by Lindsay (2017). DP was  $r(252) = .15, p < .01$ . This suggests that nurses that are high in SPS are more prone to DP. Also, as expected, a significant correlation existed between HSPS and extraversion and negative emotionality scores, with  $r(252) = -.42, p < .001$ , and  $r(252) = .57, p < .001$ , respectively. This signifies that people higher in SPS are less extraverted; people higher in SPS tend to be more neurotic. In addition, SPS was significantly correlated

with conscientiousness,  $r(252) = -.23, p < .001$ , and open-mindedness, with  $r(252) = .23, p < .001$ . This suggests that people higher in SPS are more open-minded, and people higher in SPS are less conscientious.

## Regressions

Given the number of regression analyses performed in the present study, family-wise error was controlled using a Bonferroni correction. A total of eight regression analyses were performed resulting in a more restrictive p-value of .006. Of note, a Bonferroni correction is a conservative approach to controlling family-wise error although it did not influence final significance judgments for the variables of interest. Linear regression analyses were conducted to determine if support existed for Hypothesis 1, 1a, and 1b. Regression results revealed that SPS was a significant predictor of overall nursing stress after controlling for age, sex, years of nursing experience and personality ( $R^2 = .141, \Delta R^2 = .033, F(9, 242) = 4.403, p = .003$ ) (See Table 2). This indicates that for overall nursing stress, HSPs struggle

Table 2

*Hierarchical Regression Analysis Predicting Nursing Stress From SPS*

Predictor	Nursing Stressor Subscales							
	NSS Total <sup>a</sup>		Work Load <sup>b</sup>		Inadequate Preparation <sup>c</sup>		Death & Dying <sup>d</sup>	
	$\Delta R^2$	$\beta$	$\Delta R^2$	$\beta$	$\Delta R^2$	$\beta$	$\Delta R^2$	$\beta$
Step 1	.038*		.012		.037*		.018	
Age		-.199*		-.040		-.186*		-.204*
Sex		.055		.052		-.037		.013
Years of Nursing		.186*		.039		.024		.219*
Step 2	.069**		.044		.087***		.045*	
Extraversion		.103		.169*		-.093		.148
Agreeableness		.037		.003		.040		.113
Conscientiousness		.053		.087		-.049		.011
Negative Emotionality		.171*		.065		-.020		.034
Open-mindedness		-.029		-.012		-.131*		.057
Step 3	.033**		.053***		.058***		.006	
SPS		.249**		.315***		.329***		.104
Total $R^2$	.141**		.108***		.181***		.069	
<i>n</i>	252		252		252		252	

$p < .05$ . \*  $p < .01$ . \*\*  $p < .001$ . \*\*\*

more than non-HSPs. While still controlling for personality, follow-up regression analyses

revealed that SPS significantly predicted inadequate preparation the most ( $R^2 = .181$ ,  $\Delta R^2 = .058$ ,  $F(9, 242) = 5.952$ ,  $p = .000$ ). This suggests that if an HSP feels inadequately prepared overall at work, he or she experiences more stress compared to non-HSPs. The second-strongest predicted dimension of burnout was work load, ( $R^2 = .329$ ,  $\Delta R^2 = .053$ ,  $F(9, 242) = 3.258$ ,  $p = .000$ ), while death & dying was not found to be significantly predicted by SPS, ( $R^2 = .069$ ,  $\Delta R^2 = .006$ ,  $F(9, 242) = 1.978$ ,  $p = .221$ ). For workload, HSPs were more stressed if they perceived their volume of work to be too much overall. The non-significant prediction of death and dying is an unexpected unique finding, as this stressor has been found to be the third most frequent and intense stressor in previous literature (Gray-Toft & Anderson, 1981a). This finding indicates that in nursing, HSPs are not significantly stressed by death and dying-related events like their non-sensitive counterparts. These regression findings also indicate that SPS is a stronger predictor for some specific nursing stressors over others, particularly when compared to the general nursing population.

Table 3

*Hierarchical Regression Analysis Predicting Burnout From SPS*

Predictor	MBI Total <sup>a</sup>		Burnout Subscales					
	$\Delta R^2$	$\beta$	EE <sup>b</sup>		DP <sup>c</sup>		PA <sup>d</sup>	
	$\Delta R^2$	$\beta$	$\Delta R^2$	$\beta$	$\Delta R^2$	$\beta$	$\Delta R^2$	$\beta$
Step 1	.013		.037*		.031		.041*	
Age		-.057		-.100		-.156		.188*
Sex		-.035		.010		-.102		-.001
Years of Nursing		-.034		.022		.018		-.125
Step 2	.132***		.253***		.080**		.240***	
Extraversion		.167*		.039		-.003		.285***
Agreeableness		-.039		-.074		-.267***		.199**
Conscientiousness		.126*		.110*		.025		.062
Negative Emotionality		.190*		.340***		.043		-.204**
Open-mindedness		.018		-.041		.020		.079
Step 3	.092***		.076***		.015*		.003	
SPS		.411***		.379***		.169*		.075
Total $R^2$	.236		.367**		.126*		.283	
<i>n</i>	252		252		252		252	

$p < .05$ . \*  $p < .01$ . \*\*  $p < .001$ . \*\*\*

After linear regression analyses, stronger relationships were revealed between SPS

and burnout, thereby Hypothesis 2 and 2a were supported. Family-wise error was controlled with the Bonferroni test. Specifically, SPS significantly predicted total burnout after controlling for age and personality, ( $R^2 = .213$ ,  $\Delta R^2 = .091$ ,  $F(7, 244) = 10.679$ ,  $p = .000$ ; see Table 3). SPS significantly predicted the subscale of EE ( $R^2 = .367$ ,  $\Delta R^2 = .077$ ,  $F(7, 244) = 20.200$ ,  $p = .000$ ), while both DP and PA were nonsignificant. Thus, it appears that HSPs are more prone to burnout than they are to stress, and emotional exhaustion seems to be a major contributor to this relationship. Furthermore, the non-significance of DP and PA suggests that SPS is not a predictor for either one, further clarifying the relationship examined for Research Question 1.

Although sex, age, and years of nursing were positively skewed, these were included as controls in the regression analyses for five reasons. First, previous literature supports the inclusion of these controls due to their relation to the outcome variables (Adeb-Saeedi, 2002; Chen et al., 2009; Solanki et al., 2015). Second, the proportion of sex amounts to roughly 84% females and 16% males, which corresponds fairly with the national average of about 88% females and 12% males in nursing (United States Department of Labor, Bureau of Labor Statistics, 2017). Third, this approach is a more conservative one based on taking into account any potential unique variances that may be contributed by the control variables, whether they are significant or normal or not any of these criteria. Fourth, even if a study were conducted to specifically gather more male nurses to even out sex to meet normal assumptions, there could still be an inherent conflict. The equal groups of sexes would still not be representative of the population as a whole, as there are presently more females in the nursing profession. Lastly, given the large sample size of 252, moderate deviations from

normal are less impactful and therefore less of a concern (Tabachnick & Fidell, 2012).

## **DISCUSSION**

In the present study, the relationships between nursing stress and burnout and SPS were explored within the nursing profession. SPS correlated overall with nursing stress, burnout, five nursing subscales of stress, and two subscales of burnout. SPS was shown to be a predictor for overall nursing stress and overall burnout. In addition, SPS was also shown to be a predictor of two nursing stress sub-dimensions and one burnout sub-dimension. Thus, SPS appears to play an integral role in nursing stress and burnout, even after taking into account other key pieces of data and all five dimensions of personality.

### **Limitations**

Several limitations must be noted prior to discussing this study's conclusions. First and foremost, a portion of this study's participants were recruited from online sources such as a few non-screened nursing groups of Facebook, Allnurses and Reddit. While precautions were taken to ensure that the participants taking the surveys were actually employed in the nursing field, it is possible that the sample included non-nurses. Each platform was screened for potential non-nursing members, lay-person or visitor inquiries. Additionally, no incentive was provided for completing the study. In a study on Reddit users, Shatz (2017) concluded that when gainful incentives are not offered in such online studies, the chances of disingenuous users taking the survey are mitigated. Furthermore, Jamnik and Lane (2017) also found that participant responses from online sources such as Reddit were comparable to university participants in terms of validity and measurement reliability. Thus, while it is unlikely that there were any non-nurse participants in the study, it is still a possibility.

A broader and more general nursing sample was utilized for this study, as

compared to a more defined nursing sample analyzed in the Gray-Toft and Anderson (1981a) study. This could potentially contribute to any differences in statistical findings when comparing these two studies. In addition, issues of common method variance may apply here as well, considering all measures were self-report. Lastly, this study did not randomize the order of the subscales, which presents the possibility of order effects. The scales were not randomized, in order to avoid priming effects on the BFM personality and SPS measures that could have resulted from participants' first taking measures that evoked more negative emotions, such as the stress and burnout measures.

Negative affect was not controlled for in the present study. Negative affect has been shown in past studies by Aron and Aron (1997) to account for artifacts in results which could be due to experiencing a negative state when taking the survey measures. Although participants were not assessed for this, Smolewska (2006) concluded in her study that the state of negative affectivity does not interfere with measurement of SPS.

Lastly, the variables of age, sex and years of nursing experience were included as control variables in the regression analyses due to their relevance to the outcome variables, as seen in previous literature and findings of correlation in the current study. However, it is possible that the skewness of these variables may have made their contributions to the outcome variables of stress and burnout difficult to analyze and interpret. Despite the aforementioned limitations, the present study provides a number of contributions to the study of SPS, nursing, stress, and burnout.

### **Theoretical Implications**

**Former Recommendations.** The current study follows through on a number of the

recommendations from the Lindsey (2017) study that was conducted among the teaching profession. First, the present study examined data from a larger sample. Second, the current study extended the analysis of the SPS construct to another helping profession, specifically healthcare. Finally, the present study explores the contributions of the SPS trait in understanding stress and burnout; thus, the relatively new study of the SPS construct in organizations continues to expand the existing literature outward.

**Nursing Stress.** The present study revealed a number of interesting relationships between SPS and stress and nursing. First, regression analyses demonstrated a relationship between SPS and overall nursing stress, supporting Hypothesis 1. Furthermore, correlation analyses revealed that five out of seven nursing stress subscales were significantly related to the construct. The NSS is thus highly applicable to HSPs, even though the sub-dimension of death & dying and conflict with other nurses were non-significant. Based on the present study, SPS appears to most relate to nursing stress when aversions are encountered in the form of high workloads, perceptions of inadequately filling needs, uncertainty, social conflict, and a lack of social support. These aversions are consistent with those theorized about in SPS theory. The stressor of conflict with other nurses was not found to be a source of stress for HSPs overall. The reason for this is not exactly clear. However, there is a possibility that the specific content that is assessed under this subscale may not pertain as directly to the SPS population or studied sample.

SPS was also found to be a predictor for the nursing stress subscale of workload, supporting Hypothesis 1a. For those with SPS, the automatic and deep processing of the input of all internal and environmental surroundings will not subside in light of increased

demands in the work schedule. Instead, cognitive demand will increase as a response, which will most likely contribute to becoming overwhelmed by this increase in demand. Stress will most likely continue to climb until the workload amount is decreased in some way.

SPS also significantly predicted the nursing stress subscale of inadequate preparation, supporting Hypothesis 1b. Furthermore, inadequate preparation was the largest predicted nursing stressor, slightly overtaking workload stress. Inadequate preparation pertains to not being able to sufficiently deal with or handle the needs of patients and patient families. In nursing, emotional support is essential, especially with patients. Although SPS has been previously connected to higher empathy (Cooper, 2014), the nurse who is highly sensitive must feel as if they are making a positive difference in the lives of patients and their loved ones. HSPs also experience heightened emotional exhaustion in stressful and helping professions (Lindsay, 2017). The nurse who is highly sensitive may also experience increased stress from not being able to provide sufficient emotional care for patients if their emotional resources are being constantly depleted. Furthermore, the stress of being unable to assist patients and their families emotionally could also be worsened by higher workloads, as HSPs were shown in the present study to become more stressed with increased workloads. Lastly, HSPs in general are more sensitive to the processing of their internal emotions (Aron & Aron, 1997), and pick up on the cues of others, especially when they are negative (Cooper, 2014). If the nurse who is highly sensitive thinks patients perceive them as not being effective in dealing effectively with the patient's emotional concerns, then experiences such as these may also be stressful.

Although death and dying was not hypothesized to be unrelated to SPS, this was

explored during analyses due to the fact that the nursing stressor of death and dying was previously reported by Gray-Toft & Anderson (1981*a*) as a top three most frequently reported stressor in the general nursing population. However, the finding that SPS did not significantly predict the nursing stressor of death and dying in this study was unanticipated but non-surprising at the same time. This finding is consistent with a previous fMRI study done by Acevedo et al. (2014) comparing HSP and non-HSP individuals, which found that higher sensitivity resulted in more detached involvement or non-reward when pictures of sad facial expressions of strangers were viewed. However, when sad pictures of an HSP's close partner was shown, this resulted in the opposite finding, where more emotional reaction in the form of reward occurred. Even though HSPs are naturally and highly empathetic (Cooper, 2014), they may actually be able to better deflect experiencing intense negative emotions from the death and dying of patients of whom they do not personally know. This is likely a positive benefit for the HSPs in nursing, considering nurses in general have ranked death and dying as the second most frequent stressor of all (Gray-Toft & Anderson, 1981*a*).

**Nursing Burnout.** In addition to its relationships with stress, SPS was found to be a significant predictor for overall burnout. Therefore, Hypothesis 2 was supported. SPS was also a significant predictor of the sub-dimension of EE, in support of Hypothesis 2a. Nursing has already been previously deemed an emotionally challenging profession in terms of providing various kinds of support for patients and their families (Roberts & Grubb, 2013). With regard to EE, one study has demonstrated that when an HSP experiences repeated exposure to aversive stimuli, their ability to identify, process and manage their emotions will become diminished (Austin, Saklofske, & Egan, 2005 as cited in Vesely, Saklofske, &

Nordstokke, 2014). Based on the present study's findings, EE is a primary challenge and problem for the nurse who is highly sensitive. This appears to be mainly due to social engagements or aversions such as social conflict or the perception of being unable to meet others' needs. Examples of these might include conflict with providers or the inability to socially, emotionally or spiritually tend to patients, friends of patients, or family members when there is a need that becomes apparent.

The present study also explored the research question of whether a statistical relationship existed between SPS and the other two dimensions of burnout and, if so, what the nature of this relationship was. While there was no relationship detected among SPS and PA, there was a weak but clear significant correlational relationship between SPS and DP. This was a new finding compared to previous literature. This result could possibly be more evident in studies with larger sample sizes or perhaps even among different occupational populations. DP is categorized as a type of cynicism and negative evaluation towards others (Cooper, 2014). Since HSPs are heavily affected and exhausted by negative social interactions, these present more of a strain for them compared to non-HSPs (Aron & Aron, 1997; Aron, Aron & Jagiellowicz, 2012). From an SPS theoretical perspective, if no meaningful content or capitalization can be derived from these negative social experiences, then the result is a high-level waste of cognitive expenditure and resources (Aron & Aron, 1997; Aron, Aron & Jagiellowicz, 2012).

**SPS Construct Independence.** Finally, the present study showed that SPS is related to but uniquely distinct from several factors of the FFM model. SPS was found to be a significant predictor of stress and burnout even after controlling for all five factors of

personality, even though not all five were significantly correlated with SPS or the study's related outcomes. The implication of this is that SPS is a trait that can be assessed and be of significant assistance to both employees and organizations when it comes to utilization of its scale in the workplace.

### **Practical Implications**

**Nursing Stress.** In addition to the theoretical light that the present study sheds on the construct of SPS, a number of important practical implications are indicated by the findings. According to the Gray-Toft and Anderson (1981a) study, workload was ranked as the most frequent stressor for all of the units that were assessed. In the present study, workload was ranked as the second most frequent stressor for HSPs, which is still a very serious problem in this population. Considering these findings, workload stress will most likely affect nearly every hospital unit at certain times; the frequency and intensity at which this occurs will negatively affect HSPs at varying degrees.

SPS also significantly predicted the nursing stress subscale of inadequate preparation. This type of stress was the most frequently reported among HSPs, which differs from the highest stressor of workload for non-HSPs. The nurse is highly sensitive will most likely have to figure out a type of system in dealing with their patients' emotional concerns in a sufficient manner. This especially applies if they maintain a very busy schedule throughout the day with various types of tasks or happen to have many patients to take care of as their assignment. The HSP may also have to figure out other ways to preserve their emotional energy, as most of it will be spent with people in general. Therefore, the nurse may want to make an assessment of which people require the most expenditure of energy during

interaction. Then, the HSP may be able to better decide or determine in a disciplined manner on appropriate time limits for spending with each person, including patients, and also how they choose to interact with those individuals or when they interact with them.

The finding that HSPs are more stressed than their non-sensitive peers has important implications for the safeguard of the nurse's mental and physical health, patient safety, and organizational health. First, by increasing awareness and understanding of the nature of the SPS trait, the HSP will be more able to align him or herself with work that is not only less chronically stressful, but more rewarding. Although there is a general context of stimuli or events that tend to be aversive for HSPs in general, it is important to note that not every HSP will respond to every stressor in the same way (Cooper, 2014). This means that some stressors that are overbearing for one fellow HSP may not be difficult to absorb or handle for another (Cooper, 2014; Jaeger, 2004; Lindsay, 2017). Furthermore, some mindfulness will be required in order to determine one's personal capacity for certain or existing stressors (Bakker & Moulding, 2012). If the right type of work is not chosen properly, it can negatively affect one's life outside of work due to the inability to recuperate from stress (Jaeger, 2004). This is particularly the case within the many options and fields of nursing from which and individual must choose whether to enter or stay. In the very least, Jaeger (2004) recommends that those with SPS should minimize interruptions and excessive stimulation whenever possible while at work; this is done in whatever way that can be managed. Another study recommended mindfulness and awareness training, quiet de-stressing activities such as yoga or meditation, or increasing one's self-efficacy (Evers,

Rasche & Schabracq, 2008). HSPs have a more difficult time resetting their emotions back to a normal state once they become stressed or exhausted.

Being ever-cognizant that nursing is a stressful career in general, it is important to consider additional stress that the HSP will most likely experience compared to the non-HSP beyond what has already been reported for the general nursing population. The enhanced stress in the HSP population could contribute to or worsen any medical or mental health problems. The healthcare organization is implicated by default as well. Patient safety is already a concern, as stress in nursing has already been linked to poor communication, negative patient outcomes and medical errors (Khamisa et al., 2015). Utilizing forward-thinking by investing additional resources in nurses who experience or perceive more stress than average may help to prevent various costly negative financial and social fallouts (Gray-Toft & Anderson, 1981*a*; Maslach & Leiter, 2008).

**Nursing Burnout.** Bearing in mind the predisposition to become overwhelmed, nursing presents additional strains that can create a constant and continuously aversive experience for the nurse who is highly sensitive. Over the long term, unresolved emotional exhaustion could lead to worsened burnout for the hospital nurse if cognitive recuperation does not occur. EE may occur from any sort of experience involving helping others, according to Maslach and Leiter (1982). Particularly, Jaeger (2005) describes that HSPs pay more attention to the social cues and emotions of other people than all other stimuli. Thus, they are more affected by the negative moods of others (Cooper, 2014). The hospital nurse typically engages with many people each shift, including fellow co-workers from various departments, physicians, managers, visitors and family members, and patients. Various types

of frequent interactions with many various persons can have a deleterious effect on the HSP depending on their perception of each event. Additionally, nurses with SPS who happen to suffer from some level of DP at work may withdraw from their social environment in general and become increasingly unengaged. All of this could contribute to medical and mental health problems as well as errors in the nursing profession.

### **Future Directions and Recommendations**

Based on the present study, several future recommendations exist. First, longitudinally examining the SPS trait within the field of nursing would provide useful insight into the onset, patterns, duration and worsening of signs of stress and burnout. Second, examining the role of anxiety in SPS and nursing would yield a more complete picture in terms of how the trait is related to aspects of ambiguous negative emotions. Third, nursing literature has also pointed to other areas of considerable and prevalent nursing stress. For example, role ambiguity and role conflict have been found to be a common frustration of a nurse's job (Gray-Toft & Anderson, 1981*a*). SPS has not been studied in relation to these two variables in the organizational environment. Doing so would provide more insight into how stress and burnout are related to these variables for HSPs in nursing. Future studies should also consider that analyzing the variables of age, sex and years of nursing experience with a more balanced approach might provide further insight into the construct of SPS in the nursing profession as it relates to stress and burnout. Lastly, a study that includes how death and dying related events affects nurses with the SPS trait may yield some interesting findings, especially given that SPS may prove in these cases as an emotionally protective layer to such negative experiences.

## **Conclusion**

A better understanding of the trait of SPS would most likely provide valuable contributions to many stressful and helping occupations. Since SPS exists in roughly 20% of the world's population, the societal impact of this construct could be significant. Furthermore, the field of Psychology recognizes the importance of individual differences. Indeed, as more of these differences are discovered, the increased complexity of the human condition will be more fully represented by studying traits such as SPS.

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## APPENDIX A



10/29/2018

Dr. Kyle van Ittersum  
Department of Psychology & Sociology  
Angelo State University  
San Angelo, TX 76909

Dear Kyle:

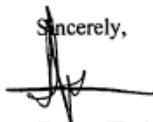
The proposed project submitted by your student, Robert Redfearn, titled "*Highly sensitive people in nursing: Stress and burnout*" has been reviewed and approved in accordance with federal regulations 45 CFR 46.

This protocol is approved for one year effective October 29, 2018, and it expires one year from this date. If the study will continue beyond one year, you must submit a request for continuation before the current protocol expires. The documentation for continuing review must be received with sufficient time for review and continued approval before the expiration date of October 29, 2019.

Please note that any revisions to these approved materials must be approved by the IRB prior to initiation. All unanticipated problems involving risks to subjects or others, and any unexpected adverse events must be reported promptly to this office.

The approval number for your protocol is #VAN-102918. Please include this number in the subject line of in all future communications with the IRB regarding the protocol.

Sincerely,



Teresa (Tay) Hack, Ph.D.  
Chair, Institutional Review Board

Dr. Teresa Hack, IRB Chair | ASU Station #11025 | San Angelo, Texas 76909  
Phone: (325) 486-6121 | Fax: (325) 942-2194

Member of the Texas A&M University System - Equal Opportunity Employer

## APPENDIX B

# ANGELO STATE UNIVERSITY Institutional Review Board

## HUMAN SUBJECTS REVIEW FORM FOR NEW OR PERIODIC REVIEW

Please complete this form and the required informed consent form. Print a copy for your records as well.

Principal Investigator (PI)	Robert Reifearn	
PI Department	Psychology and Sociology	
Campus Address	ASU Station #10907	
Primary Phone	(325) 486-6246	
Primary E-mail	kvanittersum@angelo.edu	
Project Title	Highly sensitive people in nursing: Stress and burnout	
Proposed Initiation Date	10/25/18	Project will be valid for one (1) year upon approval unless changes are made that require further IRB review.

### Student-led Projects

If the Principal Investigator is a student, please provide the following information:

Faculty Advisor/Mentor	Dr. Kyle W. van Ittersum
Student Classification (check one)	<input type="radio"/> Undergraduate <input checked="" type="radio"/> Graduate

### Funding Source

- This research is supported in whole or in part using internal/external grants or other funding sources.  
*if you checked the box above, you must complete the field below.*

Source(s)

### Special Conditions

- This research will use populations other than the ASU student participant pool(s).  
*if you checked the box above, approval from other IRB committees may be required before the project can initiate. This must be discussed in your summary of proposed activities.*
- This proposal describes a series of studies on a particular topic (programmatic research)  
*Research that is programmatic should include all possible experimental manipulations and measures that could be used within the context of the program. Programmatic research must be reviewed annually and any novel methods, measures or conditions must be presented to the Board before they are used. The Board recognizes that programmatic research does involve some ambiguity regarding future directions and will take that into account in its review.*

Please provide a description of your project by responding to the following categories. Cut and paste the summary in the spaces provided below. If additional space is needed, you may e-mail additional pages to the IRB chair (contact the Sponsored Projects Office for that information).

**General Summary:** Provide a brief summary of the proposed research activity or program. Include the primary research question and a brief description of the proposed strategy to answer the question. Include a small set of core references (cited in the text) connecting your project to the extant literature. Include information about any collaborators, including whether students will be utilized as experimenters.

Finally, any and all of the following issues **MUST** be stated in this section: intent to use any substance that may be ingested or absorbed, intent to remove bodily fluids or tissue, intent to use disadvantaged populations and/or populations who cannot legally give consent. *if the research does not involve any of these issues, you MUST explicitly state that in your Summary statement.*

#### Summary

Copious amounts of research support the indication that nursing is a stressful profession (Roberts & Grubb, 2014) with high levels of burnout (Khamisa, Oldenburg, Peltzer, & Ilic, 2015). Occupational stress and burnout is linked to numerous health and mental health problems for the employee (Khamisa, Oldenburg, Peltzer, & Ilic, 2015) and negative outcomes for the organization (Halbesleben, 2008) as well as patients (Aiken, Clark, Sloane, Sochalski & Silber, 2002). Thus, increasing our knowledge of nursing-related stress and burnout will benefit nurses, organizations and future patients in terms of increased health, safety and quality outcomes (Roberts et al., 2013).

The present study seeks to examine whether HSPs (Highly Sensitive People)(also known as Sensory Processing Sensitivity, or SPS) as nurses report higher stress levels and burnout levels than those nurses who are low in sensitivity and whether HSPs as nurses tend to avoid working in areas perceived as high stress.

SPS is a predictor. SPS is characterized by a heightened sensitivity to internal and external stimuli among individuals who possess the trait (Aron, Aron & Jagiellowicz, 2012). SPS is linked to 20% of any general population, and can predispose individuals to emotional over-arousal and behavioral difficulties due to this increased sensitivity (Aron, 2004). HSPs that encounter too much or new stimuli at once have previously revealed increased stress levels when compared to their less sensitive counterparts (Bakker & Moulding, 2012). Also, HSPs have been found to be less tolerant to prolonged or intense stimuli, including meeting strangers or large groups (Aron & Aron, 1997). Lastly, I will inquire what type of relationship is described between HSPs, who show higher levels of stress in general, and the major sources of nursing stress (Gray-Toft & Anderson, 1981).

There is no intent to use any substance that may be ingested or absorbed, remove bodily fluids or tissue, or use disadvantaged populations and/or populations who cannot legally give consent for this study.

**Detailed Description of Methodology:** Provide details about the experimental methodology that you will employ in your study or research program. This section *MUST* be organized into separate paragraphs and labeled as follows: A) Participant information (populations utilized, recruitment procedures, number of participants to be recruited, conventions for anonymity and confidentiality of data); B) Measures (measurement devices, information about validity and reliability, necessary references and justifications for use); C) Procedures (track a hypothetical participant through the study; if you are describing programmatic research, include examples of how this hypothetical track could be altered based on preliminary findings); D) Special Topics (intent to use deception, protections for special populations or invasive procedures).

#### Methodology

##### A) Participant information (populations utilized, recruitment procedures, conventions for anonymity and confidentiality of data)

Inclusion criteria for participants will include a minimum of age of 18 and older and a registered status as a nurse or practical or vocational nurse who is currently employed in one of these roles in the United States. Participants will be recruited by means of convenience and snowball sampling through documented correspondence of approval from the administrators of the groups of interest of the following websites: the nursing community forum on [www.reddit.com](http://www.reddit.com), entitled "r/nursing," from various nursing groups found on facebook (including "The Emergency Nurse" and "I Love Nursing-VIP") and from the nursing community forum on [www.allnurses.com](http://www.allnurses.com), which also includes their organizational facebook page titled "Nurses Rock." All of the group administrators just listed have already given their written approval through online facebook messenger or email correspondence, which is attached separately. I am still awaiting and still requesting correspondence of approval from several other facebook nursing groups as well. Permission will be obtained and documented on the same attachment form. If approved by more moderators, I will submit an amendment request to the IRB. By word of mouth sampling, the researcher's personal contacts through facebook, telephone and in person who are nurses will also be approached with the option to take the study as well. The same rules of consent will apply to this group as well. Participation in the study is voluntary. The header used to recruit applicants for the present study on online forum and facebook posts will read: "Nursing study survey: A fresh look on stress and burnout."

Participants will be identified using a three-digit participant identification number. Confidentiality will be ensured by allowing only the researcher and faculty advisor/mentor to access the data, which will not be linked to personal identifiers. No individual-level analysis will be performed or reported. In published reports, there will be no information included that will make it possible to identify the research participant. Findings will only be presented in aggregate with no personally identifying information to ensure confidentiality.

Since Highly Sensitive People make up only 20% of any given population, I hope to attain at least 30 of these participants, which means I am hoping to collect at least 150 participants and up. My ultimate hope is 220 participants, which would be optimal in order to utilize the full function of the BFI-2-S form (Soto & John, 2017). This data will be obtained from the Fall until mid-way through the upcoming Spring semester.

The data will be retained for 3 years after completion of the study. The paper data will be maintained in a locked filing cabinet in the private office of the Jackson Street Psychology lab. Digital data will be maintained on the data servers of the Qualtrics survey system, which is employed by the university. This system has been approved as having appropriate security and encryption protocols in place.

##### B) Measures (measurement devices, information about validity and reliability, necessary references and justifications for use)

First, participants will complete the shortened version of the Highly Sensitive Person Scale to measure temperamental sensitivity (HSPS; Evers, Rasche, & Schabracq, 2008; Smolewska, McCabe, & Woody, 2006). The shortened HSPS has three subscales: Ease of Excitation (EOE; 8 items), Aesthetic Sensitivity (AES; 5 items) and Low Sensory Threshold (LST; 5 items). The response format is a Likert scale, from 1- Not at All, to 7- Extremely. Cronbach's coefficient alpha for the entire scale was .86; EOE was .77; AES was .71; LST

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was .85 (Evers, Rasche & Schabracq, 2008). Intercorrelations among the subscales were .24 for EOE and AES, .65 for EOE and LST, and .24 for AES and LST (Evers, Rasche & Schabracq, 2008). Researchers tested the internal consistency reliabilities of the shortened scale and found them to be at the same levels of the original full length scale reliabilities of .87 and .85 (Evers, Rasche, & Schabracq, 2008; Smolewska, McCabe, & Woody, 2006).

Next, participants will complete the Big Five Inventory-2-Short form (BFI-2-S) to measure personality facets. The facets include extraversion (6 items), agreeableness (6 items), conscientiousness (6 items), negative emotionality (6 items) and open-mindedness (6 items). The response format is a reverse-coded Likert scale, from 1- Disagree strongly to 5- Agree strongly. The BFI-2-S form has been shown to retain about 90% of the BFI-2 form's domain scales' reliability, self-peer agreement, and external validity, and the BFI-2 form's original alpha reliabilities of the domain scales average about .86, with a range of .81 to .90 across three separate samples. The personality scores collected will be used as potential covariates.

Next, participants will complete the Nursing Stress Scale (NSS), which will reveal data on the seven major sources of nurse stress. The factors include work load (6 items), death and dying (7 items), inadequate preparation (3 items), lack of staff support (3 items), uncertainty concerning treatment (5 items), conflict with physicians (5 items) and conflict with other nurses (5 items). The response format is a Likert scale, from 0- Never to 4- Very Frequently. Test-retest reliability coefficients for 4 of the 7 subscales exceeded .70 (Gray-Toft & Anderson, 1981). Internal consistency measures exceeded .70 for all components with the exception of two subscales (Gray-Toft & Anderson, 1981).

Participants will then complete the Maslach Burnout Inventory for Medical Personnel (MBI-HSS), which allows for the analysis of aggregate data related to worker burnout for those who spend the most direct time with patients, including nurses. Three dimensions are measured, which are Emotional Exhaustion (9 items), Depersonalization (5 items) and Personal Accomplishment (8 items). The response format is a Likert scale, from 0- Never to 6- Every Day. Previous Cronbach alpha estimates have been around .90 for Emotional Exhaustion, .79 for Depersonalization and .71 for Personal Accomplishment, although the Depersonalization alpha estimates have occasionally fallen below the recommended cutoff score of .70 (Maslach, Jackson & Leiter, 1996). Test-retest reliabilities have been around .74 for Emotional Exhaustion, .72 for Depersonalization and .65 for Personal Accomplishment at the  $p < .001$  level. In terms of validity, the MBI-HSS has demonstrated a high predictability score of .68 at  $p < .001$  with the intention to quit in one study (Gray-Toft & Anderson, 1981). Adequate discriminant validity has also been demonstrated as well (Gray-Toft & Anderson, 1981).

Participants will then complete the Mindfulness Attention Awareness Scale (MAAS; 15 items), which measures dispositional mindfulness and awareness of what is presently going on in the moment (Bakker & Moulding, 2012). The response format is a Likert scale, from 1- Almost Always to 6- Almost Never. A higher score to each statement, such as, "I do jobs or tasks automatically, without being aware of what I'm doing" means a higher score on dispositional mindfulness. Internal consistency has been found to be around .82, and test-retest reliability around .82 as well (Kotze & Nel, 2016). The MAAS will be assessed for moderator effects on HSPs that show significance with stress levels.

Then, participants will complete the Acceptance and Action Questionnaire-II (AAQ-II; 7 items), which measures psychological flexibility and acceptance (Bakker & Moulding, 2012). The response format is a Likert scale, from 1- Never True to 7- Always True. Test-retest reliability is .81 and .79, respectively and the mean alpha coefficient is .84 (Bond & Hayes, 2011). The AAQ-II has also been shown to have adequate discriminant validity also. The AAQ-II will be assessed for moderator effects on HSPs that show significance with stress levels.

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Lastly, a demographic questionnaire will be administered. All measures have been attached as a separate document.

C) Procedures (track a hypothetical participant through a study; if you are describing programmatic research, include examples of how this hypothetical track could be altered based on preliminary findings)

The study will be self-administered online during each participant's available time; therefore, all materials will be presented on a computer, and all responses will be entered into the computer by participants.

**1. Signing the informed consent form. Approximately 2-5 minutes.**

The participant will read the Informed Consent Form on the computer screen where they choose to complete the online study, and asked to indicate if they are willing to participate in the experiment. If the participant does not consent to participate then or at any point, they may choose to discontinue and exit the study without penalty.

**2. Completion of questionnaires and demographics. Approximately 18-22 minutes.**

Participants will complete the HSPS, the NSS, the MBI-HSS, the MAAS, the AAQ-II and the demographics form.

Demographics Questionnaire. The demographics questionnaire consists of various demographic questions pertinent to the study that will be measured as potential covariates. This information is also helpful to determine the external validity of the study.

**3. Debriefing. Approximately 1-2 minutes.**

At the end of the study, the participants will be debriefed about the true nature of the study. Finally, participants will be thanked for their participation.

D) Special Topics (intent to use deception, protections for special populations or invasive procedures)

We do not intend to use any deception, special populations or invasive procedures in this study.

**Procedures for PI Contact:** In this section, describe how inquiries, complaints and/or grievances concerning the proposed study will be addressed. This section **MUST** be organized into two separate paragraphs and labeled as follows:

- A) Addressing Participants (how you will address inquiries, complaints, and/or grievances concerning the study, including a description of where you will provide participants with the contact information for the PIs and the IRB administrator [consent form, debriefing form, etc.]); and
- B) Participant Debriefing (how you will debrief the participants and give them access to information about the study's results).

**Procedures for Grievance**

A) The debriefing form will explain the full nature of the study. Contact information for the principal investigator and IRB administrator is also provided on both the informed consent and debriefing forms, should the participants have any inquiries, complaints, and/or grievances.

B) At the end of the study and before exiting, participants will be asked and prompted to read a debriefing statement, which will include a "thank you for participating in this study" statement, a more specific description of the purpose of the study and what was examined in the study, and what may be discovered about highly sensitive people working in nursing with regards to stress and burnout the results may reveal. Also, included will be contact information of the investigators should any participants have any questions or inquiries about the study. Participants will also be able to utilize this same contact information to request the results of the study when they become available, and are also given multiple related study references should they wish to learn more about any of the main topics covered in the study. Lastly, participants are also informed about the potential risk of a loss of confidentiality for utilizing email to contact the researcher for such information. I would have listed the debriefing form here, but I did not have enough room to copy and paste it.

I am familiar with the policies and procedures of Angelo State University and 45 CFR 46 regarding human subjects. I subscribe to these standards and will adhere to them at all times.

I understand that approval of the project as described herein in no way permits the researcher to alter the research program or study beyond the constraints placed on the Board's approval and/or the constraints on human subjects research as outlined in 45 CFR 46. Unapproved deviation from the approved protocols as contained in this document that increases participant risk is STRICTLY PROHIBITED.

**Principal Investigator Signature (type names of each principal investigator)**

*Robert A. Redfearn*

I (We) affirm that the signature above was completed by the person(s) named therein.

**For Student-Led Projects**

**Faculty Advisor/Mentor Signature (type names of each faculty advisor/mentor)**

I (We) affirm that the signature above was completed by the person(s) named therein.

## APPENDIX C



ANGELO STATE UNIVERSITY  
College of Graduate Studies  
*Institutional Review Board*

11/19/2018

Dr. Kyle van Ittersum  
Dept. of Psychology, & Sociology  
Angelo State University  
San Angelo, TX 76909

Dear Kyle:

The amendment request that you submitted for your student, Mr. Robert Redfearn, for his previously approved project titled, "*Highly sensitive people in nursing: Stress and burnout*" has been reviewed and APPROVED.

The approved addendum is effective beginning November 19, 2018. Please be aware that the protocol will expire one year from its original approval date which will be October 29, 2019. If the study will continue beyond that date, you must submit a request for continuation before the current protocol expires.

The approved addendum is for protocol #VAN-102918. Please include this number in the subject line of in all future communications with the IRB regarding the protocol.

Sincerely,

A handwritten signature in black ink, appearing to read 'Teresa Hack', with a horizontal line extending to the right.

Teresa Hack, Ph.D.  
Chair, Institutional Review Board

*Dr. Teresa Hack, IRB Chair | ASU Station #11025 | San Angelo, Texas 76909  
Phone: (325) 486-6121 | Fax: (325) 942-2194*

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