

**EMOTIONALLY UNSTABLE PERSONALITY TRAITS AS PREDICTORS
FOR TRADITIONAL AND DIGITAL FORMS OF NON-SUICIDAL SELF-
INJURY**

by

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LIST OF ABBREVIATIONS

NSSI	Non-Suicidal Self-Injury
DSM-5	Diagnostic and Statistical Manual of Mental Disorders, fifth edition
APA	American Psychiatric Association
BPD	Borderline Personality Disorder
FFM	Four-Function Model

ABSTRACT

The area of research that was investigated for this study is self-harm, which is also known as non-suicidal self-injury (NSSI). NSSI can be defined as self-injury with no intention of dying. Examples of NSSI are the cutting of one's skin or banging one's head against the wall to the point of bruising. Digital self-harm (DSH) can be defined as cyberbullying directed at oneself. DSH is an area within NSSI and self-harm that has not been extensively studied. However, its consequences have already been fatal; in 2013, a 14-year-old suicide in the United Kingdom was linked to DSH. In this case, DSH manifested itself by masking as cyberbullying, when instead it was the individual themselves who was behind the malicious comments. Research shows that there are several risk factors for NSSI, one of which includes borderline personality disorder (BPD). BPD is a type of personality disorder that consists of impulsive and volatile mood. A high percentage of individuals diagnosed with BPD have been found to engage in NSSI. The current study conducted an anonymous Internet survey that measured the following variables: engagement in NSSI, engagement in DSH, what types of NSSI/DSH were engaged in, personality traits, and interpersonal/intrapersonal functions for engaging in NSSI or DSH. The study revealed that among freshmen at a large, Midwestern university ($N = 112$), individuals who engaged in NSSI were significantly more likely to engage in DSH. The sample included 61 (55%) of students who self-reported engaging in NSSI and 17 (15%) of students who reported engaging in DSH. However, the study did not find that all BPD personality traits correlated with individuals who engaged in DSH. Personality facets and functioning were similar among DSH and NSSI. Differences were found in levels of reinforcement function between individuals who engaged in DSH and NSSI. These results suggested a relationship between DSH behavior and BPD features, as well as the use of maladaptive strategies for self-regulating emotion. The authors conclude that future research should investigate different types of DSH and encourages clinical practitioners to include online behavior questionnaires in their evaluations of at-risk adolescents.

CHAPTER 1. INTRODUCTION

1.1 Background and Significance

On August 2, 2013, 14-year-old English teenager Hannah Smith committed suicide (BBC.com, 2014). Her parents found online a trail of hurtful messages directed at their daughter via the social media site Ask.fm. They approached the police and used these online messages as proof that their daughter had been the victim of cyberbullying. However, after further digging, a detective connected IP addresses from Hannah's laptop and the hurtful posts, strongly suggesting that Hannah herself had been authoring the hurtful messages. These posts were made just a few weeks before she took her own life. Hannah's death is a fatal consequence of the phenomenon known as digital self-harm, a form of self-injury where individuals will intentionally make hurtful comments about oneself through online networks. Digital self-harm can also be conceptualized as self-cyberbullying.

Hannah Smith was not the first mainstream suicide linked to cyberbullying. Years before Hannah Smith's suicide, 18-year-old Tyler Clementi committed suicide after being cyberbullied by his college roommate (Parker, 2012). In 2013, following the release of a tell-all video detailing multiple accounts of cyberbullying and admitting to self-mutilation and cutting, a 15-year-old named Amanda Todd committed suicide (Todd, 2012). What differentiates Hannah's story from Tyler and Amanda's stories is that on the surface it appeared that Hannah was another victim of cyberbullying, when in reality this was one of the first mainstream cases of digital self-harm linked to suicide. A few years before Hannah's suicide, a Microsoft researcher first used the term "digital self-harm" to describe a self-harassing behavior that she had observed among a social media platform called Formspring. She discovered that there were users who were first using an anonymous account to write themselves mean questions, and second using their personal account to answer those mean questions (Boyd, 2010).

There have been a few studies in digital self-harm that have attempted to investigate the prevalence. A 2012 study surveyed a sample over 600 college aged students and discovered that in high school, 9% reported engaging in digital self-harm (Englander, 2012). A 2016 study surveyed over 5,000 US adolescents ages 12-17 and found that 6% of students admitted to digital self-harm (Patchin & Hinduja, 2017). The authors of the latter study defined digital self-harm as the sharing harmful content about oneself online in an anonymous (Patchin & Hinduja, 2017). However, limited research exists on the motivations

and predictors of digital self-harm and its connection to traditional forms of self-harm, such as non-suicidal self-injury (NSSI).

NSSI refers to the intentional injuring of oneself without intention to die (APA, 2013). Traditional forms of self-harm include intentionally cutting parts of the body such as one's arms or wrists without suicidal intention. Other forms include burning of the skin with a cigarette, cigarette lighter or match; causing bruising on the head due to repeated banging; or preventing a wound from healing (Gratz, 2001). A 2017 study on NSSI prevalence in university students found that 45% of college freshmen admit to lifetime engagement in NSSI, while 20% of college freshmen admit to current engagement in NSSI (Wester, Trepal, & King, 2018). Chronic NSSI has been linked to many negative consequences, the most serious being suicide attempts and completions (Whitlock et al., 2013; Cooper et al., 2005; Hawton & James, 2005; Conner et al., 2003), as well as infection, hospitalization, and accidental death (Briere, 1998). This study explored the connection between NSSI and digital self-harm, and specifically looked at NSSI as a digital self-harm risk factor.

1.2 Research question

The main question that was studied in this thesis is:

- What is the relationship between digital self-harm and NSSI?

In the study, additional sub-questions were investigated to accompany the primary research question:

- Is digital self-harm related to traditional forms of NSSI?
- What individual differences are related to digital self-harm?

1.3 Assumptions

In this study, the assumptions that were taken include:

- The questions in the survey were answered truthfully and with integrity. If the responses were determined to be false or exaggerated, their responses were excluded from the final analysis.
- All participants have an understanding of technology, social media, and the permutations of online posting. For example, it was assumed that participants understand what it means to “anonymously post online.”

1.4 Limitations

The limitations for this study included:

- The survey was anonymous and gathered no data that identified the participants.
- An online survey platform generated responses from the sample population, which may represent selection bias.
- The types of digital self-harm included those that were used in previous studies, which could miss certain types and variations.

1.5 Delimitations

The delimitations of the study included:

- Due to time constraints with obtaining multiple forms of consent, the sample population only consisted of adults who are 18 and older, and did not include adolescents.
- Several studies suggest that NSSI occurs during adolescence (Skegg, 2005; Nock & Prinstein, 2004). Examination of hospital admissions suggest that NSSI related admissions reach their peak from ages 20-29 and declines afterwards (APA, 2013). As a result, this study aimed to explore behavior around the adolescent years, so the maximum age of participants was 19.
- The study only collected and analyzed quantitative data; qualitative data from context and experiences was not assessed.
- Incomplete data from the data collection portion of the study was disregarded during the data analysis phase.

1.6 Summary

This chapter expands on the background of the current study's research, as well as its main research questions. NSSI was introduced, and the prevalence of NSSI and its potential consequences were reviewed. This chapter also outlined the limitations, assumptions, and delimitations of the study. In the following section, self-harm literature will be reviewed, as well as the literature describing digital self-harm, and the many predictors that have been characterized for self-harm.

CHAPTER 2. LITERATURE REVIEW

2.1 Self-Harm

2.1.1 Self-Mutilation

The origins of the scholarly use of self-harm can be traced back centuries. A historian from ancient Greece described a Spartan leader who used a serf's knife to mutilate himself (Spiegel, 2005). A physician in the early 20th century used "self-mutilation" when discussing types of symbolic masturbation (Emerson, 1913). The term was more rigorously studied by psychiatrist Karl Menninger in 1938 when he proposed a psychoanalytic antisuicide model that considered self-mutilating acts as partial or microsuicides (Menninger, 1938). Menninger proceeded to create a classification system for six types of self-mutilation: neurotic, religious, puberty rites, psychotic, organic brain diseases, and conventional.

Individuals were considered neurotic self-mutilators if they picked or bit their nails, underwent unnecessary cosmetic surgery or extreme hair removal. Individuals were considered religious self-mutilators if they would self-flagellate. Individuals were classified with puberty rites if they altered their genitalia in any way, including circumcision, clitoral alteration, or hymen removal. Individuals were considered psychotic self-mutilators if they removed parts of their body such as limbs, eyes, or ears. Individuals were classified with organic brain diseases if they displayed patterns of repetitive head-banging, eye removal or hand-biting. The types of behavior considered conventional self-mutilation include nail-clipping, hair trimming, or shaving beards.

Self-mutilation via cutting was further differentiated as low lethality or high lethality (Pao, 1969). Low lethality self-mutilation cuts were considered "delicate" and consisted of a multitude of young, superficial cuts. Individuals who were classified as "delicate" cutters generally were diagnosed with borderline personality disorder (Pao, 1969). Alternatively, high lethality cutters were classified as "coarse." They were usually older in age and displayed many psychotic features (Pao, 1969).

Over the past several decades, more effort has gone into the classification or in some instances, re-classification of self-mutilation, perhaps revealing dissatisfaction in the existing systems. In 1979, a pair of psychiatrists created nine groups of self-mutilation: constricting, abrading, inserting, hitting, cutting, biting, severing, ingesting or inhaling, and burning (Ross & McKay, 1979). Self-mutilation was later classified into four groups numbered I-IV, with each subsequent classification increasing in the degree of physical damage, and decreasing social acceptability (Walsh & Rosen, 1988). For example, ear-piercing

was classified as category I due to its mild degree of physical damage and most accepted social nature, while wrist-cutting was classified as category III due to its moderate degree of physical damage and it being not generally accepted by the population. Most forms of category I self-mutilation, including tattooing and body piercing, would not be classified as NSSI by the DSM (Nock, 2009). Taking culture into account, self-mutilation was divided into the following categories in 1993, deviant self-mutilation and culturally sanctioned self-mutilation (Favazza & Rosenthal, 1993). The former category was further divided into two subcategories, rituals and practices. Culturally sanctioned self-mutilation reflects traditional symbols and culture within a society (Favazza & Rosenthal, 1993), while deviant self-mutilation reflects behavior that comes from the individual, separate from culture or tradition.

2.1.2 Non-Suicidal Self-Injury

The fifth and most current edition of the APA's Diagnostic and Statistical Manual of Mental Disorders (DSM-5) uses the phrase non-suicidal self-injury (NSSI) with regards to self-harm. NSSI is understood to be the deliberate injuring of oneself without intent to commit suicide (APA, 2013). NSSI did not appear in the fourth edition of the DSM or the International Classification of Diseases, tenth revision (ICD-10) (In-Albon et al., 2013). NSSI is considered a condition for further study under the Emerging Measures and Models section. In the last few decades, there has been increasingly more research dedicated to the study of NSSI. Its increase in prevalence has led to the classification of NSSI as a public health problem (Doshi, 2005). NSSI behavior typically originates during an individual's adolescent years, between the time when one is 12 and 16 years old (Skegg, 2005). Factors such as the tendency for adolescents to be more impulsive and emotionally reactive are likely to make an individual's adolescent years particularly vulnerable to NSSI (Ladouceur, 2012).

NSSI originates and is highly prevalent during an individual's adolescent years. A recent study in Europe reported that 27.6% of adolescents admitted to having committed an act of self-harm at least once in their lives. This ranged from 17.1% in Hungary to 38.7% in France. In addition, 7.8% report recurrent NSSI (Brunner et al., 2014). A 2019 Canadian study of youths aged 13-17 who visited Emergency Departments in Ontario revealed two contrasting trends over time. From 2003-2009, youths who presented with self-harm related complaints fell 32%. However, from 2009-2017, these same complaints rose 135% (Gardner et al., 2019). The authors postulated two reasons for this increase over the past decade: the first being the financial crisis of 2008, and the second being the introduction of the iPhone in 2007. Soon after these events, social media began to erupt in popularity.

Beyond one's adolescent years, recent research indicates that NSSI continues into one's college years. In the US, a 2006 study reported that 17% of university students sampled between 18-24 admitted to having committed an act of self-harm at least once in their lives. Of these, 75% reported having committed self-harm recurrently (Whitlock, Eckenrode, & Silverman, 2006). These results were supported by a review of NSSI engagement across ages; individuals 18-25 fell into the highest risk group for individuals who could engage in NSSI (Rodham & Hawton, 2009). Among university students, lifetime engagement in NSSI is high, ranging from 36% (Harrison, 2009) to 45% (Wester et al., 2017). Wester et al. also reported that 20% of the freshman university students surveyed in 2015 reported current engagement in NSSI. These high prevalence rates suggest a heightened need to address NSSI among populations of college-aged students.

Emotion dysregulation and NSSI are closely related (Chapman et al., 2006; Nock 2009). Emotion dysregulation is a multi-dimensional concept that includes an unwillingness to deal with emotional distress (Linehan, 1993). Carpenter and Trull posited four components of emotion dysregulation: excess maladaptive regulation strategies, emotion sensitivity, increased and volatile negative affect, and a shortage of strategies to properly regulate one's emotions (Carpenter & Trull, 2013). Thus, individuals may turn to NSSI in order to achieve higher levels of emotion regulation. The regulatory functions that NSSI serves can be classified as either interpersonal or intrapersonal (Nock & Prinstein, 2004). Interpersonal behaviors can be considered socially reinforcing, while intrapersonal behaviors can be considered automatically reinforcing, or reinforced by oneself. Individuals who engage in NSSI have described the function to be effectively reducing tension (McKenzie & Gross, 2014) and state that it helps them feel better and reduces negative affect (Nock & Prinstein, 2004; Klonsky 2007).

The Four-Function Model (FFM) of NSSI is a model of reinforcement processes that serve to preserve NSSI behavior (Nock & Prinstein, 2004). In addition to the two classifications of interpersonal (social) or intrapersonal (automatic), the FFM also includes a dimension for positive and negative types of behavior. Social positive reinforcement posits that NSSI helps generate attention for the individual engaging in that behavior. An example of social positive reinforcement is when an individual attempts to acquire more control of a situation. Social negative reinforcement suggests that NSSI helps an individual distance themselves from social situations. An example of social negative reinforcement is how an individual will try to avoid being around others. Automatic positive reinforcement conceives NSSI to help improve positive affect and stimulate better moods. An example of automatic positive reinforcement is activating the desire to feel something, even if the feeling is painful. Automatic negative reinforcement

suggests that NSSI allows for an individual to decrease negative affect. An example of automatic negative reinforcement is when an individual is motivated to stop oneself from feeling bad. A recent review on the most commonly reported reinforcement types for NSSI found eight studies that endorsed automatic negative reinforcement, contrasted to only two studies that endorsed interpersonal reinforcement (Hepp et al., 2020). Understanding the associations between processes in the FFM and NSSI can uncover insights into engagement in NSSI behavior and lead to predictions in increased probability of future engagement in NSSI.

2.1.3 Risk Factors of NSSI

2.1.3.1 Individual Differences

Personality Disorders

Fox et al. (2015) conducted a large-scale NSSI risk factor meta-analysis by analyzing published, prospective studies that predicted NSSI from a longitudinal perspective. From 2,165 unique papers initially identified, 20 papers and 168 prediction cases were screened and incorporated in the final meta-analysis. The researchers identified three risk factors with strong effects: hopelessness, the existence of cluster B personality traits, and a previous record of NSSI (Fox et al., 2015). The authors conclude that there is a need to identify more NSSI risk factors that have a strong effect. One purpose of this study is to address a type of group of cluster B personality traits, specifically those related to borderline personality disorder.

Cluster B personality disorders consist of antisocial personality disorder, borderline personality disorder, histrionic personality disorder, and narcissistic personality disorder (see: APA, 2013). A hallmark of antisocial personality disorder is that these individuals do not usually comply with social norms, lie recklessly, and do not take into account concerns for others. Borderline personality disorder (BPD) consists of volatile mood, self-image, and impulsivity. Individuals with histrionic personality disorder are usually emotionally unstable and attention-seeking. The last cluster B personality disorder, narcissistic personality disorder, features ideas of grandiosity, lack of empathy, and seeking out admiration. All four of these disorders are described as beginning in early adulthood, which aligns with the age period when researchers typically expect to see NSSI behavior start in individuals (Skegg, 2005).

Recent literature on personality traits has sought to reclassify personality disorders as dimensional models in contrast to the categorical models currently used in DSM-5 (Kotov et al., 2017). The five-factor

model is a personality construct that has been validated and assesses general personality traits from a dimensional perspective (McCrae & Costa, 2003; McCrae et al., 2005).

Borderline Personality Disorder (BPD)

A recent study of Australian youth (15-25 years of age) with BPD revealed that over three-quarters reported a lifetime engagement with NSSI and over the past year, nearly two-thirds of all participants reported attempting suicide (Andrewes et al., 2019). While these are alarming rates, it should be expected, as self-mutilating behavior is one criteria of how BPD is diagnosed in the DSM-5 (APA, 2013). A proportion of individuals with BPD —nearly 10%—die by suicide (Gunderson, 2011; Björkenstam et al., 2015), highlighting the importance of developing effective methodologies to treat BPD.

As mentioned previously, emotion dysregulation is a function of NSSI. Emotion dysregulation is also associated with individuals with BPD and high levels of neuroticism (Few et al., 2016). In a study of individuals aged 18-35 who were diagnosed with BPD, Zanarini et al. found that NSSI engagement was reported by 81% of the participants within the previous two years (Zanarini et al., 2005). A study on 111 psychiatric inpatients connected early onset NSSI with an increased risk to develop BPD (Groschwitz et al., 2015). In a selection of students from colleges and universities in the New York City area that required inpatient psychiatric treatment, nearly one in six patients were diagnosed with BPD (Braider et al., 2018).

There are consistent findings that suggest that a dimensional understanding of BPD could be a more helpful approach to conceptualizing the personality disorder categorically. Recent research has identified the following facets of the five-factor personality model that consistently comprise BPD individuals: six neuroticism facets (high anxiousness, high depressiveness, high angry hostility, high impulsiveness, high vulnerability, and high self-consciousness), one openness to experience facet (high fantasy), and three agreeableness facets (low compliance, low trust, and low straightforwardness), and one conscientiousness facet (low deliberation) (DeShong, Grant, & Mullins-Sweatt, 2019). These profile elements correspond closely with the results of a study on NSSI among undergraduate freshmen. In this study, one facet of extroversion (low assertiveness) and two facets of conscientiousness (low dutifulness and low self-discipline) were additional features of the students who engaged in NSSI (MacLaren & Best, 2010).

Given that NSSI is prevalent in individuals with BPD, this study will investigate whether the personality inventories of individuals who admit to digital self-harm reflect these five-factor model facets of BPD.

Childhood Maltreatment

There is much empirical research that show childhood maltreatment is present in 30-90% of individuals with BPD diagnoses (Bouchard et al., 2009). The types of maltreatment can include chronic neglect, as well as many several types of abuse (Cohen et al., 2014). Similarly, childhood trauma has been implicated as being a significant predictor for NSSI (Yates, 2003; Van der Kolk, et al., 1991). Strong evidence exists linking childhood maltreatment with suicidal thoughts and behavior (Cha, Franz, Guzmán, Glenn, Kleiman, & Nock, 2018); however, suicidal thoughts and behavior are not necessarily predictors of engagement in NSSI (Fox et al., 2015). A recent study of self-reported measures of parental maltreatment indicated that opposite-gender maltreatment (mother-son or father-daughter) predicted borderline personality related symptoms, including tension reduction behaviors such as NSSI (Godbout et al., 2019). The authors explained this relationship via attachment theory, noting that attachment anxiety was significantly higher when participants reported maltreatment from a parent from the opposite gender.

Emotional Disorders

Bentley et al. (2015) published an extensive meta-analysis about the association between prototypic emotional disorders and NSSI. Their study defined prototypic emotional disorders as including disorders related to anxiety, mood, trauma, obsessive-compulsive, and other stressors. Panic disorder and PTSD were shown to have the highest associations with engagement in NSSI. Among those with an emotional disorder, higher NSSI engagement was observed (Bentley et al., 2015). The present study has chosen not to take into account emotional disorders, but given the high prevalence of emotional disorders, future studies should consider emotional disorders as an important risk factor for NSSI.

2.1.3.2 Gender

Regarding gender as a risk factor, there has been mixed data as to whether gender is a reliable predictor. A 2015 study interviewed 111 adolescent psychiatric inpatients which revealed that female patients were significantly more likely to meet the criteria for NSSI-disorder diagnosis (Groschwitz et al., 2015). Similar data has been shown in populations outside of an in-patient setting (see Table 2.1). However, there have also been studies on NSSI prevalence that have shown that gender is not a significant predictor of NSSI (see Table 2.1). There have even been studies indicating the male gender is the significant gender predictor, in a population of the American Air Force (Klonsky et al., 2003) and among a college population at a Midwestern university (Harrison, 2009).

2.1.3.3 Technology

Adolescents today have a vulnerability for technology usage. A 2015 survey of teenager technology usage found that 75% of American adolescents have a smartphone that can access the Internet. Of these with a smartphone, 92% reported that they will go online everyday, and 24% reported that their Internet usage was “almost constant” (Lenhart, 2015). In particular, social media is a natural platform for adolescents to gravitate to once they start using a smartphone. Given this attachment to technology, it would make sense for NSSI behavior to manifest on social media. In January 2015, there were 24 million less posts that used the #depression hashtag than there were that were used the #happiness hashtag (11 million to 35 million, respectively). Of these #depression posts, approximately 27% of them also included the hashtag #cutting (Fischer, 2015).

Using social media to express NSSI thoughts and behavior has both benefits and risks. Potential benefits have been identified as a decrease in NSSI urges, a feeling of belonging in one’s community, emotional self-disclosure, and motivation to pursue recovery (Dyson, 2016; Lewis & Seko, 2016). However, social media also has negative consequences, some of which include normalizing NSSI behavior, triggering NSSI urges, making NSSI live streams more prevalent; and NSSI reinforcement by social means (Lewis & Seko, 2016). Social reinforcement is considered a significant predictor for NSSI (Nock & Prinstein, 2004). It also appears that NSSI pictures cause different reactions in people. A 2013 study showed that exposure to pictures with NSSI content caused a decrease in feelings of loneliness in some participants, while in others there was an increase in the desire for NSSI (Baker & Lewis, 2013). Live streaming NSSI may lead to higher viewership numbers, comments, or likes, which can be thought of as positive social reinforcement.

Modernized technology has undeniably created an additional platform for adolescents to perpetrate and be victimized by harmful behaviors. A review of literature on cyberbullying of a seven year period from 2007-2014 found that 25% of adolescents reported being cyberbullied at least once, and even more concerning, 16% reported that they themselves had been the perpetrators of cyberbullying (Hutson, 2016). A recent study on online search prevalence showed that Google receives 42 million annual search requests that are related to NSSI (Lewis et al., 2014). NSSI on Instagram is also a cause for concern; Instagram users have developed hashtags to avoid control of the automatic moderation of the network, using hashtags like #selfinjuryyy (Moreno et al., 2016). Web-based communication was identified as a strong risk factor for suicidal thoughts and behaviors in boys, but not girls, from a Taiwan adolescent sample (Tseng & Yang, 2015). NSSI predictors and corresponding authors can be found in Table 2.1.

Table 2.1 List of NSSI Predictors

Predictor	Author
Prior history of NSSI	Fox et al. (2015)
Cluster B personality traits	Fox et al. (2015)
Hopelessness	Fox et al. (2015)
Female*	Groschwitz et al. (2015) Zetterqvist et al. (2013) Moran et al. (2012) Plener et al. (2009) Muehlenkamp & Gutierrez (2007) Whitlock et al. (2006)
High levels of stress	Miller et al. (2019) Baetens et al. (2014)
Opposite-gender parental abuse	Godbout et al. (2019)
Childhood trauma	Yates (2003) van der Kolk et al. (1991)
High impulsivity	Ladouceur (2012)
Web-based peer communication (for males)	Tseng & Yang (2015)

* = There has been research showing that male gender predicts NSSI (see: Harrison, (2009), Klonsky et al., (2003)) and that gender has not been a significant factor in predicting NSSI (see: Ewing et al., (2019), Whitlock et al., (2011), Hilt et al., (2008), Gratz et al., (2002)).

Brown et al. (2018) studied NSSI hashtags based in Germany found a total of over 32,000 NSSI-related images over a 4-week period. The average age of the users' posts was 14.8 years; however, a limitation to this data is that not every Instagram user publishes their age as public information (Brown et al., 2018). Additionally, an analysis of the comments that were made on the posts tagged with NSSI-related hashtags showed that 6.8% of comments ($n = 450$) were abusive in nature (Brown et al., 2018). However, the study did not clarify who authored the comments, posing the question of whether the

comments were traditional forms of cyberbullying, or a new form that has only recently been studied known as digital self-harm.

2.2 Digital Self-Harm

Digital self-harm can be understood as self-injury where individuals will intentionally make hurtful comments about oneself through online networks. The current research on digital self-harm is limited but demonstrates that the phenomenon is present. Englander was one of the first to study this behavior in 2011 and 2012 among over 600 freshman at Bridgewater State University in Massachusetts. Englander's results showed the 9% of subjects admitted to posted a mean comment "against" themselves, which she also referred to as self-cyberbullying (Englander, 2011). With respect to gender, Englander reported that 13% of boys admitted to digital self-harm, as opposed to 8% of girls. (Englander, 2012).

Englander described the phenomenon of digital self-harm as "Digital Munchausen" because of its resemblance to Munchausen's Syndrome and Munchausen Syndrome by Proxy (Englander, 2012). Since the publication of the Englander, DSM-5 was released and these psychiatric disorders have been reclassified as factitious disorder imposed on self, and factitious disorder imposed on another, respectively (APA, 2013). DSM-5 describes a requirement for diagnosis of factitious disorder as deliberate actions whose purpose is to misrepresent an injury or illness, without clear motivations or external rewards (APA, 2013). Applying this requirement to digital self-harm, there are several areas of overlap that appear. An individual who engages in digital self-harm makes an anonymous account in order to create the impression that they are a victim of cyberbullying. However, it does not cleanly meet the requirement of absence of obvious external rewards. More research is necessary to help uncover the expected rewards for individuals who choose to participate in digital self-harm.

Two studies conducted recently have looked at the occurrence of digital self-harm within a population of US freshmen and adolescents. A 2017 study of over 5,000 US students, who were currently enrolled in middle school or high school, showed that 6.2% indicated involvement to the item "I have anonymously posted something online about myself that was mean" (Patchin & Hinduja, 2017). When accounting for gender, 7.1% of males and 5.3% of females indicated involvement. The same study showed that 5.3% indicated involvement to "I have anonymously cyberbullied myself," with the gender breakdown here being 6.3% for males and 4.2% for females. There is clearly a discrepancy in responses between the two question types, as well as between genders. The former discrepancy suggests that some students may not have understood that posting a mean comment about oneself is considered self-

cyberbullying, which perhaps was a strong factor in including the two separate response types. The latter discrepancy aligns with the gender breakdown results found in Englander's 2012 study. A 2019 New Zealand study surveyed 1110 adolescent teenagers and found that 9% of boys and 7% of girls admitted to recently posting anonymous negative comments online towards themselves (Pacheco et al., 2019).

In their 2017 study, Patchin and Hinduja included an open-ended question to try to understand digital self-harm motivations and functions. One theory of self-harm is that the purpose of it is to improve mood. Contrary to this theory, the majority of respondents in this study stated that the main reason that they participated in digital self-harm was self-hate. One student described already feeling bad, and the motivation for the self-harm was to further that bad feeling (Patchin & Hinduja, 2017). The other motivations were categorized as follows: Looking for reaction, To be funny, Depressive symptoms, Attention seeking, and Other. The example given for other discussed a false belief that others hated the participant because of an expectation that others should make the participant happy (Patchin & Hinduja, 2017).

2.2.1 Alternative Definition

Digital self-harm has also been defined as online activity that supports NSSI, particularly of an individual's physical wellbeing (Pater & Mynatt, 2017). Online communities have facilitated the discussion of eating disorders as a reasonable lifestyle alternative. These communities, also known as "pro-eating disorder" communities (pro-ED), view eating disorder behaviors as acceptable rather than threatening to one's personal health (Borzekowski et al., 2010). Instagram and other social media platforms have offered solutions that monitor and prevent the proliferation of pro-ED content. Unfortunately, this moderation has contributed to the creation of social media lexicon that attempt to circumvent the restrictions. Tags such as "thighgap" or "thinspiration" see common variants on Instagram as "thyghgap" or "thynspiration". These variant communities have been shown to encourage Instagram users to continue their pro-ED lifestyles as well as share more self-harm content (Chancellor et al., 2016). A hashtag analysis across Tumblr, Instagram, and Twitter of ED-related social media content showed 33.4% of content was specifically related with Anorexia, Bulimia, or General Eating Disorders, while 7.1% of content was associated with self-injury or self-harm (Pater et al., 2016).

With regards to the current study, it should be noted the behaviors that are considered digital self-harm will be directly related to online activity that is inherently self-harmful, not merely online activity that supports NSSI.

2.2.2 Trolling and Cyberbullying

Digital self-harm, specifically self-trolling and self-cybertrolling, are facets of cyber online aggression, specifically trolling and cyberbullying. Both of these phenomena would not be possible if it were not for the creation of Internet communities. Trolling was first identified as an obscure phenomenon that was unlikely to stay in the mainstream culture of Internet usage (Tepper, 1997). As the years have gone by, it is clear that this was an inappropriate initial classification, as trolling has evolved into many forms of hostility and abuse (Bishop, 2014; Jane, 2015; Seigfried-Spellar & Chowdhury, 2017).

Similarly, cyberbullying is a recent addition to the Internet vernacular, defined as the use of electronic contact methods to act aggressively towards a victim who has difficulty acting in self-defense (Smith et al., 2008). An expert on technology and safety outlined seven types of cyberbullying, of which include impersonation, exclusion, flaming, outing and trickery, harassment, denigration, and cyberstalking (Willard, 2006). Flaming is the sending of electronic messages with intention to instigate online verbal altercation. Harassment messages tend to be rude, offensive or insulting. Denigration messages seek to damage people's reputations or relationships. Impersonation involves assuming another individual's online identity and using that position to damage the victimized individual's reputation or relationships. Outing and trickery reveal sensitive information about an individual which is then distributed online. Exclusion can be thought of as blocking an individual from participating in an online group. Cyberstalking messages usually are threatening in nature or contain intimidating language.

Sest and March recently found that sadism and trait psychopathy were significant risk factors of trolling behavior (Sest & March, 2017). These results are corroborated by past studies (Craker & March, 2016; Buckels, Trapnell, & Paulhus, 2014). If sadism and trait psychopathy predict trolling, then it is possible that they also predict self-trolling or digital self-harm.

Cyberbullying has been linked to suicidal ideation. Specifically, cross-sectional studies have indicated that individuals who were involved as either a perpetrator or victim of cyberbullying were more suicidal in terms of thoughts and engaging in suicide attempts than those who hadn't experienced cyberbullying (Hinduja & Patchin 2010; Bauman et al., 2013; Litwiller & Brausch, 2013). It is therefore a natural conclusion that if individuals will participate in self-harm more if they are victims of cyberbullying, then those same individuals will likely also engage in digital self-harm.

2.3 Summary

The concept of NSSI is not a novel one. However, the past several decades have seen a remarkable rise in the incidence and prevalence of self-harming activity. There are many risk factors that have been studied with regards to predicting NSSI. However, there are missing pieces in the existing research on digital self-harm and in particular, the connection between risk factors that predict NSSI and the risk factors that predict digital self-harm. Drawing from the recent studies shown in this review, the current study attempted to obtain a new standpoint on digital self-harm that can reveal more about its relationship to NSSI and assist in the clinical diagnosis and treatment of NSSI.

CHAPTER 3. METHODOLOGY

3.1 Hypothesis

As previously discussed, research has shown that there are many risk factors that can predict NSSI. Little research to date has examined the association between NSSI and digital self-harm. This study examined whether personality traits play a determinant role in the type of person who will participate in self-harm or digital self-harm. With respect to existing literature, the following hypotheses were developed:

H₁: Individuals who engage in traditional forms of NSSI are more likely to engage in digital self-harm.

H₂: Individuals who engage in digital self-harm will score higher on all facets of Neuroticism, and lower on certain facets of Agreeableness (i.e., low compliance, low trust, and low straightforwardness) and Conscientiousness (i.e., low deliberation).

H₃: Individuals who engage in digital self-harm will score higher on intrapersonal reinforcement functioning than interpersonal reinforcement functioning.

A summary of H₁ and H₂ is shown in Figure 3.1.

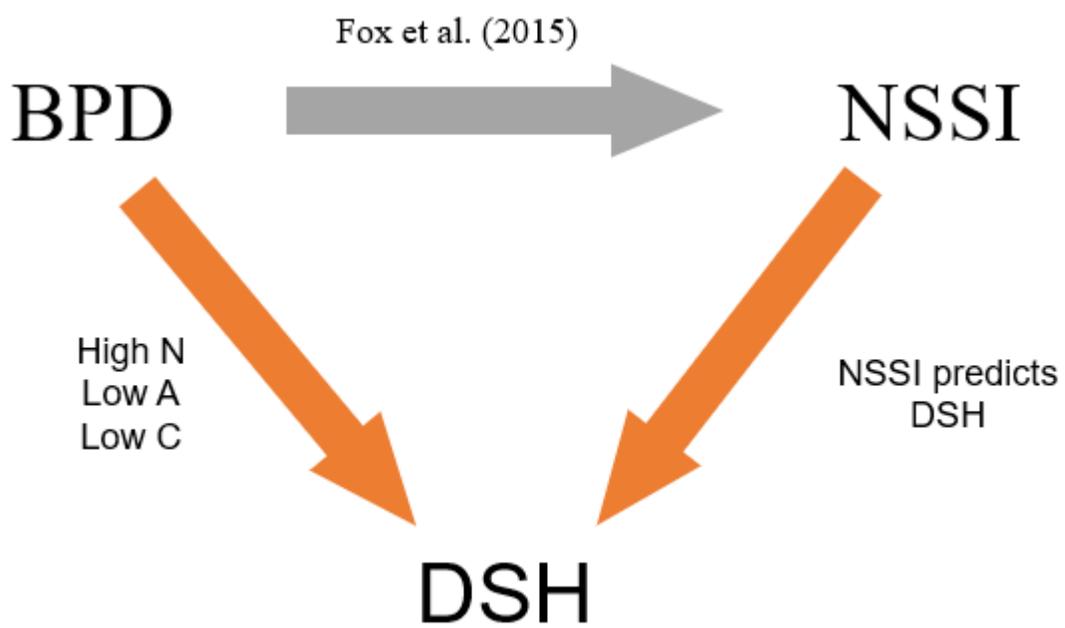


Figure 3.1 Theoretical Model for the Relationships between BPD, NSSI, and DSH

A summary of H₃ can be found in Figure 3.2.

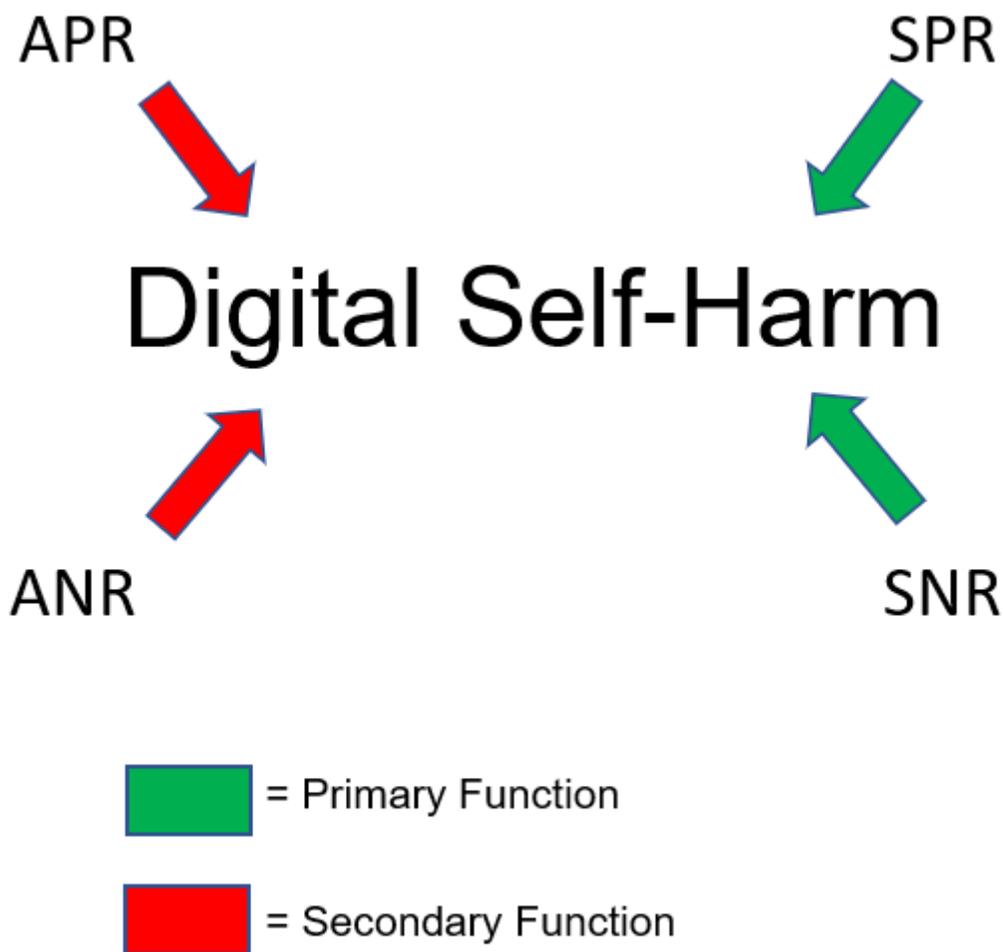


Figure 3.2 Theoretical Model for the Reinforcement Functions of DSH

3.2 Survey Design (Materials)

There were four sections in this survey (see Appendix A). The first section consisted of qualification questions. The next three sections had the following measures: the short form of the Five-Factor Borderline Inventory (FFBI-SF), an adapted version of the Functional Assessment of Self-Mutilation (FASM), and an adapted version of the Cyberbullying Deviancy Scale (CDS).

Screening and Five-Factor Model

The qualification questions screened participants for age and university status. At this stage, participants must have indicated that they are both 18 years or older, and also a freshman at the university.

The second section was the FFBI-SF. The long form, FFBI, is a 120-question scale that was developed to use the Five-Factor Model in order to understand BPD traits. The FFBI-SF is a shortened 48 item version of FFBI. FFBI-SF was shown to have good reliability with an average Cronbach alpha of .80, compared to .85 for the full version (DeShong et al., 2016). Additionally, the authors investigated convergent and discriminant validity and found strong convergence and stable correlations between FFBI-SF and the original FFBI.

Engagement in NSSI & Digital Self-Harm

The next two sections evaluated NSSI and digital self-harm engagement and motivations. An adapted version of the Functional Assessment of Self-Mutilation (FASM) was distributed to understand engagement, lifetime engagement, frequency, and intensity of self-harmful behaviors. The FASM is a scale that measures the incidence and motivations behind self-injurious behavior (Lloyd et al., 1997). Participants answered 13 yes or no questions to assess different forms of self-injurious behaviors. Two of these questions were questions asking about behaviors related to digital self-harm. Adolescent behavior that includes a history of NSSI was taken into account to create the FASM (Lloyd, 1998).

If a participant answered yes to at least one of the items in part A or B, the participant was then asked for reasons for engaging in that behavior. Each of the 22 items was scored on a 0-3 scale (0 = *never*, 1 = *rarely*, 2 = *some*, 3 = *often*). The subscales that these items comprise of have high internal consistency (see Nock & Prinstein, 2004; Hilt, Cha, & Nolen-Hoeksema, 2008).

Finally, an adapted version of the Cyberbullying Deviancy Scale (CDS) was used to assess self-cyberbullying behaviors in greater detail. The original scale assesses perpetrators of cyberbullying. To adapt for the current study, the scale converted the subject of the scale to oneself. One example adaptation was the change of “Created an Internet ‘bashing’ poll, either over IM or on a website, about someone that you know without their consent?” to “Created an Internet ‘bashing’ poll about yourself, either in a group chat or public forum?” The CTDS has shown high internal consistency (Zezulka & Seigfried-Spellar, 2016).

3.3 Sample

This study sampled undergraduate students at a large, Midwestern university. Given that previous studies have demonstrated between 6-9% of participants will admit to digital self-harm (see Patchin & Hinduja, 2017; Pacheco et al., 2019), the ideal amount of participants is greater than 1000, in order to observe a smaller effect size.

Undergraduate students were recruited through an Introduction to Psychology course that was offered in the Spring of 2020. Students who took this course were required to complete 15 units of research, where one unit of research credit was granted per one-half hour. The study expected to receive 1500 unique responses from the course. IRB approval was obtained, and students signed up to participate through the SONA Systems. In addition to PSY 120, other large lectures whose students were majority freshmen were identified. In total, 19 lectures were identified, and the professors associated with those lectures were contacted. The total number of students across these lectures was 11,081; the total number of professors contacted was 35. Of these professors, 20 (57%) responded, and of those who responded, 7 (35%) agreed to distribute the study to their students, 11 (55%) declined to distribute the study, and 2 (10%) deferred to another professor. As a result, 1,645 students from the lectures with cooperative professors were possible recipients of the study link. However, it must be noted that out of these courses, there was only a high likelihood that all students in the class were freshmen, not a guarantee. Final sample numbers and data analysis are discussed in the next chapter. No ethical guidelines from APA were violated in the treatment of all respondents.

3.4 Procedure

Before releasing the survey to the desired sample, the survey underwent a pilot test. The pilot test recruited undergraduate students in a large, public space to analyze the validity of the CDS questions. The questions were tested to see if they represented the general population and whether the question structure and phrasing was appropriate. After the pilot test, IRB approval was obtained (Protocol Number: IRB-2020-158). The survey was then posted to SONA's online system and also emailed to professors of large freshman classes, as discussed in the previous section. As part of the recruitment material, a PowerPoint slide was created with a hyperlink and a QR code for the survey, and this slide was included in the email to professors. Additionally, the registrar office was contacted to distribute the recruitment material, which included an email and a hyperlink to the survey.

The survey was hosted on Qualtrics©. Data was collected anonymously; Qualtrics assigned participants random ID numbers, ensuring the participants would remain anonymous. Participants who clicked on the hyperlink would immediately see a consent form that described the motivations of the survey. The form also assured participants that the data that was collected was both confidential and anonymous. After agreeing to the consent form, the participants were directed to a page with qualification questions. Here, they indicated their age and status at the university. Participants who stated that they were 18 years of age or less, or not a university freshman were disqualified from the survey and sent directly to the survey's last page. For those that stated that they were 18 years of age or over AND they were currently a university freshman, they were sent to the second section of the survey.

3.5 Summary

In this section, the main research hypotheses were introduced and discussed. The chapter also addressed how the proposed data was collected, as well as the procedure for how the research was conducted. An anonymous survey targeting young adults and digital natives was distributed across freshmen at a large Midwestern university. The survey collected information on Five-Factor Model personality traits, NSSI and digital self-harm behavior.

CHAPTER 4. RESULTS AND ANALYSES

4.1 Statistical Analyses

Analysis of frequencies was performed on the Functional Assessment of Self-Mutilation (FASM) questions as well as the Cyberbullying Deviancy Scale (CDS) questions to understand what the most commonly stated types of and reasons for non-suicidal self-injury (NSSI) and digital self-harm (DSH). The FASM reasons section results were recoded with “Rarely”, “Some”, and “Often” being assigned a value of 1, and “Never” being assigned a value of 0. The results of CDS were recoded with “Once”, “2-3 Times”, “4-5 Times”, and “6+ Times” being assigned a value of 1, and “Never” being assigned a value of 0. Further analysis of frequencies was conducted to calculate the sum for either NSSI or DSH, with the sum representing the total number of participants that admitted to at least one type of the behavior.

The association between self-harm types and reasons for engaging in the behavior was analyzed using a zero-order correlation. Both groups used the same variables to see if a relationship existed between certain reported reasons for the behavior and different types of self-harm (see Table 4.1). For purposes of analysis and statistics, the software SPSS was used (Statistical Product and Service Solutions, Version 26). The alpha level for statistical significance for the purpose of the analysis was set to .05.

4.2 Descriptives

In total, there were 237 total responses to the survey. Of these responses, 14 participants were excluded prior to the start of the questions: one participant did not agree to the consent form, one participant indicated that their age was 17, and twelve participants indicated that their status at the university was not a freshman. 111 participants started the survey but did not complete it. The total number of valid, complete responses was therefore 112.

A total of 61 participants self-reported engaging in at minimum one form of NSSI. The average types of NSSI engaged in was 2.84 (*SD*: 1.87). In total, 17 participants self-reported engaging in at least one type of DSH. The average types of DSH engaged in was 2.24 (*SD*: 1.25). The participants’ average age was 18.74 (*SD*: 1.19). There were a total of 59 male participants, 51 female participants, and 2 participants who self-reported as non-binary. A participant who engaged in both NSSI and DSH was more likely female than male ($p = .06$, $\phi = .30$).

4.3 Hypothesis Testing

H₁: Individuals who engage in traditional forms of NSSI are more likely to engage in digital self-harm.

Results of the Pearson correlation showed that there existed a significant positive correlation between individuals who engaged in more types of NSSI and individuals who engage in more types of DSH, $r(112) = .35$, $p < .001$, 95% CIs [1.17, 1.92] and [.16, .51], respectively. Similarly, results of the Pearson correlation showed that there existed a significant positive correlation between group membership (No/Yes) in that NSSI-engaged individuals were more likely to also engage in DSH, $r(112) = .19$, $p = .02$, 95% CIs [.45, .64] and [.08, .22], respectively. There were also a significant positive correlation between individuals who engaged in more types of NSSI and individuals who engaged in DSH, $r(112) = .36$, $p < .001$, 95% CIs [1.17, 1.92] and [.08, .22], respectively, and a significant positive correlation between individuals who engaged in more types of DSH and individuals who engaged in NSSI, $r(112) = .22$, $p = .01$, 95% CIs [.16, .51] and [.45, .64], respectively.

Results of the binary logistic regression showed a significant relationship among group membership (No/Yes) in that NSSI-engaged individuals were more likely to also engage in DSH compared to not engaging in DSH, $\chi^2(1) = 12.29$, $p < .001$, 95% CI [.97, 10.47]. The odds ratio for this finding was 1.53, suggesting that individuals who engage in NSSI are 1.53 times as likely to engage in DSH.

H₂: Individuals who engage in digital self-harm will score higher on all facets of Neuroticism, and lower on certain facets of Agreeableness (low compliance, low trust, and low straightforwardness) and Conscientiousness (low deliberation).

Individuals who engage in more types of DSH are score significantly higher on Dysregulated Anger, Despondence, Behavioral Dysregulation, Affective Dysregulation, Fragility, Dissociative Tendencies, Manipulativeness, Oppositional, and Rashness. Individuals who engage in DSH score significantly higher on Despondence, Behavioral Dysregulation, Affective Dysregulation, Fragility, and Dissociative Tendencies than individuals who do not (see Table 4.1). Individuals who engage in DSH do not score significantly higher on Dysregulated Anger, Manipulativeness, Oppositional, or Rashness than individuals who do not. There is no significant

relationship between individuals who engage in DSH and the personality facets of Anxious Uncertainty, Self-Disturbance, and Distrustfulness.

Individuals who engage in more types of NSSI score significantly higher on Anxious Uncertainty, Despondence, Self-Disturbance, Affective Dysregulation, Fragility, Dissociative Tendencies, Manipulativeness, and Oppositional. Individuals who engage in NSSI score significantly higher on Despondence, Self-Disturbance, Fragility, Dissociative Tendencies, and Manipulativeness than individuals who do not (see Table 4.1). Individuals who engage in NSSI do not significantly score higher on Anxious Uncertainty, Affective Dysregulation, or Oppositional than individuals who do not. There is no significant relationship between individuals who engage in NSSI and the personality facets of Dysregulated Anger, Behavioral Dysregulation, Distrustfulness, and Rashness.

Table 4.1 Correlations between NSSI, Personality facets, and DSH

	DSH ¹	DSH vs. Non ²	NSSI ³	NSSI vs. Non ⁴	N1	N2	N3	N4	N5	N6	N7	O1	A1	A2	A3	C1
DSH ¹	1	.861 ***	.347 ***	.218 *	.049	.197 *	.241 **	.155	.324 ***	.259 **	.313 ***	.286 **	.045	.190 *	.195 *	.271 **
DSH vs. Non ²		1	.363 ***	.187 *	.087	.147	.235 **	.083	.201 *	.177 *	.239 **	.228 **	.019	.068	.133	.108
NSSI ³			1	.718 ***	.175 *	.067	.334 ***	.291 **	.125	.199 *	.249 **	.371 ***	.115	.198 *	.169 *	.134
NSSI vs. Non ⁴				1	.129	.080	.304 **	.318 ***	.136	.141	.158 *	.295 **	.099	.181 *	.089	.113
N1					1	**	.580 ***	.487 ***	.257 **	.497 ***	.450 ***	.343 ***	.465 ***	.212 *	.285 **	.081
N2						1	.349 ***	.383 ***	.597 ***	.661 ***	.448 ***	.393 ***	.369 ***	.212 *	.285 **	.081
N3							1	.583 ***	.375 ***	.510 ***	.754 ***	.588 ***	.424 ***	.237 **	.368 ***	.218 **
N4								1	.514 ***	.609 ***	.529 ***	.619 ***	.631 ***	.621 ***	.523 ***	.359 ***
N5									1	.699 ***	.504 ***	.473 ***	.498 ***	.537 ***	.620 ***	.717 ***
N6										1	.652 ***	.429 ***	.492 ***	.481 ***	.602 ***	.528 ***
N7											1	.603 ***	.359 ***	.317 ***	.474 ***	.324 ***
O1												1	.448 ***	.371 ***	.302 **	.281 **
A1													1	.582 ***	.460 ***	.375 ***
A2														1	.565 ***	.578 ***
A3															1	.515 ***
C1																1

* $p < .05$, one-tailed. ** $p < .01$, one-tailed. *** $p < .001$, one-tailed.

1 = This variable represents the total number of DSH behaviors that participants self-reported engaging in

2 = This variable indicates if an individual engaged in DSH behavior (1) vs. did not engage in DSH behavior (0)

3 = This variable represents the total number of NSSI behaviors that participants self-reported engaging in

4 = This variable indicates if an individual engaged in NSSI behavior (1) vs. did not engage in NSSI behavior (0)

N1 = Anxious Uncertainty; N2 = Dysregulated Anger; N3 = Despondence; N4 = Self-Disturbance; N5 = Behavioral Dysregulation; N6 = Affective Dysregulation; N7 = Fragility; O1 = Dissociative Tendencies; A1 = Distrustfulness; A2 = Manipulativeness; A3 = Oppositional; C1 = Rashness

Table 4.2 Means and Standard Deviations for NSSI and DSH Engagement by Personality Facet

Personality Facet	DSH (+) ¹	DSH (-) ²	NSSI (+) ³	NSSI (-) ⁴
Anxious Uncertainty	3.88 (1.12)	3.63 (1.04)	3.79 (.96)	3.52 (1.14)
Dysregulated Anger	2.75 (1.30)	2.27 (1.16)	2.43 (1.20)	2.24 (1.18)
Despondence	3.37 (1.07) **	2.63 (1.11) **	3.06 (1.14) ***	2.37 (1.00) ***
Self-Disturbance	3.04 (1.04)	2.79 (1.11)	3.15 (1.00) ***	2.45 (1.09) ***
Behavioral Dysregulation	2.77 (1.19) **	2.20 (.97) **	2.41 (1.07)	2.13 (.94)
Affective Dysregulation	2.97 (1.21) *	2.46 (1.00) *	2.67 (1.09)	2.37 (.99)
Fragility	2.16 (1.02) *	1.68 (.64) *	1.86 (.77) *	1.63 (.66) *
Dissociative Tendencies	3.07 (1.36) **	2.27 (1.21) **	2.73 (1.28) ***	1.99 (1.13) ***
Distrustfulness	2.78 (.92)	2.73 (.98)	2.82 (1.01)	2.63 (.93)
Manipulativeness	2.10 (1.00)	1.94 (.83)	2.11 (.95) *	1.80 (.69) *
Oppositional	2.26 (.86)	1.97 (.79)	2.08 (.86)	1.93 (.73)
Rashness	2.28 (1.19)	1.98 (.96)	2.13 (1.00)	1.90 (.99)

*** $p < .01$ ** $p < .05$ * $p < .10$

1 = This indicates that the participant engaged in DSH

2 = This indicates that the participant did not report engaging in DSH

3 = This indicates that the participant engaged in NSSI

4 = This indicates that the participant did not report engaging in NSSI

A *t*-test (independent samples) was conducted to compare engagement in DSH and the significantly correlated facets of neuroticism, openness, agreeableness, and consciousness. There was a significant difference in the Despondence ($t(110) = -2.53, p = .013; d = .67$), Behavioral Dysregulation ($t(110) = -2.15, p = .034; d = .57$), and Dissociative Tendencies ($t(110) = -2.46, p = .015; d = .65$) scores between DSH engagement and no DSH engagement. There was a marginal significant difference in the Affective Dysregulation ($t(110) = -1.89, p = .062; d = .50$) and Fragility ($t(18) = -1.88, p = .076; d = .68$) scores between DSH engagement and no DSH engagement. There was no significant difference in the Anxious Uncertainty ($t(110) = -.92, p = .362$), Dysregulated Anger ($t(110) = -1.56, p = .122$), Self-Disturbance ($t(110) = -.87, p = .386$), Distrustfulness ($t(110) = -.20, p = .842$), Manipulativeness ($t(110) = -.72, p = .476$), Oppositional

($t(110) = -1.41, p = .162$) or Rashness ($t(110) = -1.15, p = .255$) scores, between DSH engagement and no DSH engagement. All means and standard deviations (*SD*) are shown in Table 4.2.

A *t*-test (independent samples) was performed to compare engagement in NSSI and neuroticism, openness, agreeableness, and consciousness personality facets. There was a significant difference in the Despondence ($t(110) = -3.35, p = .001$), Self-Disturbance ($t(110) = -3.51, p = .001$), and Dissociative Tendencies ($t(110) = -3.24, p = .002$) scores between NSSI engagement and no NSSI engagement. There was a marginal significant difference in Fragility ($t(110) = -1.68, p = .095$) and Manipulativeness ($t(108) = -1.98, p = .050$) scores between NSSI engagement and no NSSI engagement. There was no significant difference in the Anxious Uncertainty ($t(110) = -1.37, p = .175$), Dysregulated Anger ($t(110) = -.85, p = .400$), Behavioral Dysregulation ($t(110) = -1.44, p = .152$), Affective Dysregulation ($t(110) = -1.49, p = .138$), Distrustfulness ($t(110) = -1.05, p = .297$), Oppositional ($t(110) = -.94, p = .350$) or Rashness ($t(110) = -1.19, p = .236$) scores, between NSSI engagement and no NSSI engagement. All means and standard deviations (*SD*) are displayed in Table 4.2.

H3: Individuals who engage in digital self-harm will report higher intrapersonal reinforcement functioning than interpersonal reinforcement functioning.

Individuals who engaged in at least one form of DSH ($N = 17$) reported the function of that behavior as either intrapersonal (automatic) or interpersonal (social). The results are displayed in Figure 4.1.

DSH Reasoning Is Similar to NSSI Reasoning

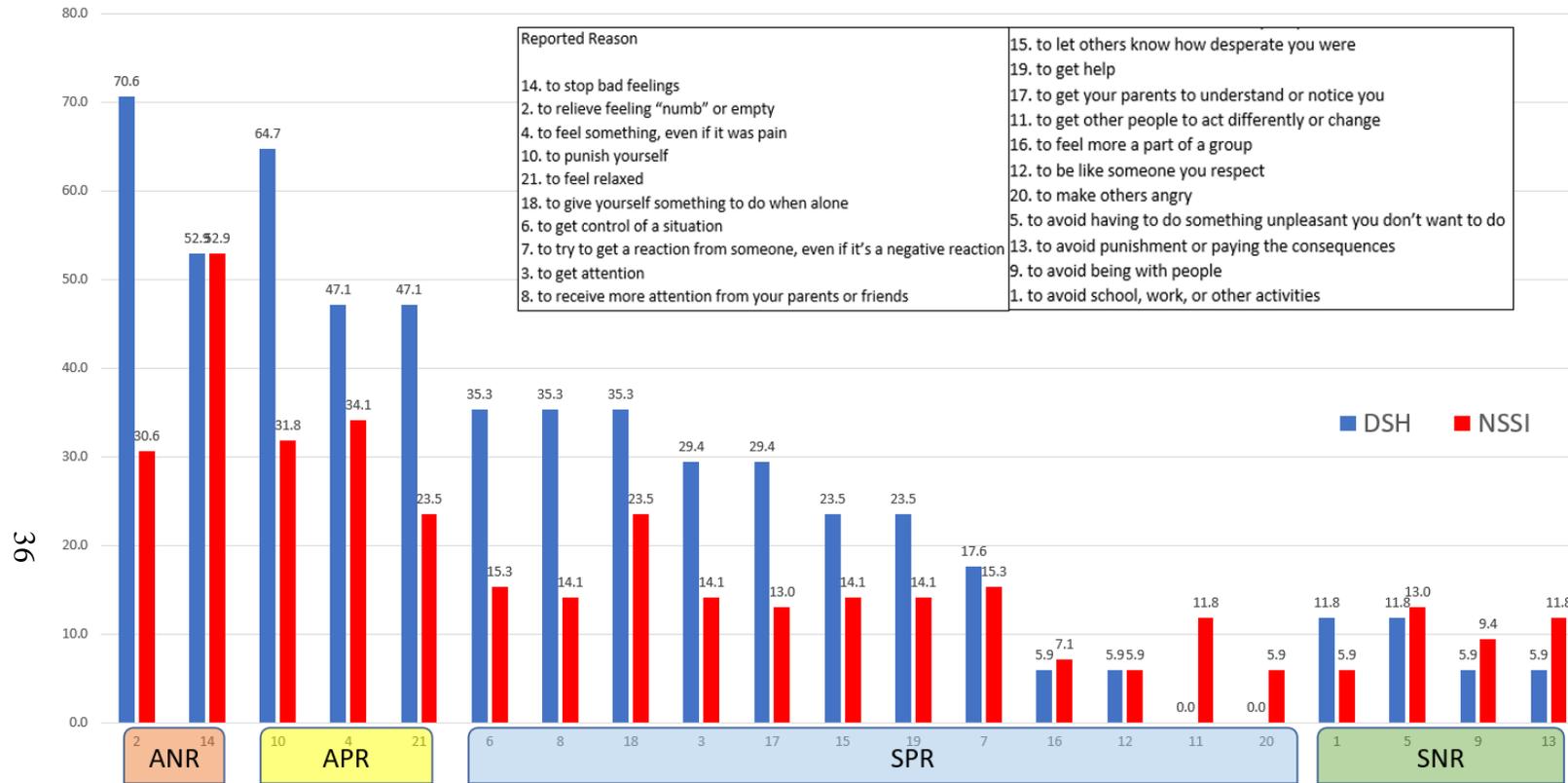


Figure 4.1 Comparing NSSI and DSH Engagement Functions

ANR = Automatic Negative Reinforcement.
 APR = Automatic Positive Reinforcement.
 SPR = Social Positive Reinforcement.
 SNR = Social Negative Reinforcement

Table 4.3 DSH Engagement and Function

Reason	DSH (+) ¹	DSH (-) ²	ϕ
2. to relieve feeling "numb" or empty	75.0%	25.3%	.393
8. to receive more attention from your parents or friends	37.5%	7.6%	.337
17. to get your parents to understand or notice you	31.3%	5.1%	.335
10. to punish yourself	68.8%	26.6%	.334
21. to feel relaxed	50.0%	15.2%	.320
6. to get control of a situation	37.5%	8.9%	.312
14. to stop bad feelings	56.3%	20.3%	.306
3. to get attention	31.3%	7.6%	.277
4. to feel something, even if it was pain	50.0%	19.0%	.271
19. to get help	25.0%	5.1%	.269
15. to let others know how desperate you were	25.0%	7.6%	.212
18. to give yourself something to do when alone	37.5%	17.7%	.182
7. to try to get a reaction from someone, even if it's a negative reaction	18.8%	6.3%	.167
1. to avoid school, work, or other activities	12.5%	6.4%	.087
12. to be like someone you respect	6.3%	2.5%	.080
5. to avoid having to do something unpleasant you don't want to do	12.5%	8.9%	.047
13. to avoid punishment or paying the consequences	6.3%	3.8%	.046
9. to avoid being with people	6.3%	6.3%	-.001
11. to get other people to act differently or change	0.0%	2.5%	-.066
20. to make others angry	0.0%	2.5%	-.066
16. to feel more a part of a group	0.0%	3.8%	-.081

1 = This indicates that the participant engaged in at least one type of DSH

2 = This indicates that the participant did not report engaging in any DSH * = (Note: in instances where χ^2 was violated, a Fischer's Exact Test was reported instead.)

Individuals who engaged in at least one form of DSH were significantly more likely to state the following reasons for engagement in DSH than individuals who did not engage in DSH: to relieve feeling "numb" or empty ($\chi^2 = 14.70$; $p < .001$); to receive more attention from your parents or friends ($p = .005$); to get your parents to understand or notice you ($p = .006$); to punish yourself ($\chi^2 = 10.59$; $p = .001$); to feel relaxed ($p = .005$); to get control of a situation ($p = .008$); to stop bad feelings ($p = .005$); to get attention ($p = .018$); to feel something, even if it was pain ($p = .021$); to get help ($p = .026$)*. Distributions and effect size can be observed in Table 4.3. The effect sizes were small to moderate for the significant values ($.269 \leq \phi \leq .393$).

CHAPTER 5. DISCUSSION

The main goal of this research was to offer new insights on digital self-harm (DSH) and its relationship to non-suicidal self-injury (NSSI). In particular, the incidence of DSH among college undergraduate freshmen was at the forefront of this study, as well as the personality types and reasons that individuals engage in DSH. 15% of individuals who completed this study admitted to engaging in some type of DSH. This is higher than what has been reported from previous studies of DSH (Englander, 2012; Patchin & Hinduja, 2017). On the other hand, 54.5% of individuals admitted to engaging in some type of NSSI. This number is also higher than previous studies that looked at college freshmen, ranging from 27% (MacLaren & Best, 2010) to 45% (Wester, Trepal, & King, 2018).

There is a significant positive correlation between individuals who admit to NSSI and DSH, both in the number of forms of DSH as well as any form of engagement. This is consistent with hypothesis one. Given that the personality scores for both DSH and NSSI individuals are similar, and the functions that DSH and NSSI serve are similar, it makes sense to have a significant relationship between NSSI and DSH engagement. Clinicians and counselors who work closely with college-age individuals should be aware of the relationship between NSSI behavior and DSH behavior.

Four facets of neuroticism (Despondence, Behavioral Dysregulation, Affective, and Fragility), one facet of openness (Dissociative Tendencies), two facets of agreeableness (Manipulativeness and Oppositional), and one facet of conscientiousness (Rashness) showed significant positive correlation with DSH engagement. In other words, individuals who reported engaging in more forms of DSH placed higher on those facets of neuroticism, openness, agreeableness, and conscientiousness. This personality scoring fits with a five-factor personality model for BPD, with the facets from this study corresponding to high depressiveness, high impulsiveness, high vulnerability for neuroticism; high fantasy for openness; both low compliance and straightforwardness for agreeableness; and low deliberation for conscientiousness (DeShong, Grant, & Mullins-Sweatt, 2019).

Among the neuroticism facets, Self-Disturbance significantly correlated with NSSI behavior, but did not correlate significantly with DSH behavior. On the other hand, Behavioral Dysregulation significantly correlated with DSH behavior, but did not correlate significantly with

NSSI behavior (see Table 4.1). The NSSI correlations are similar with a previous study of personality among undergraduates who engaged in NSSI (MacLaren & Best, 2010). A reasonable elucidation for this inconsistency is that NSSI behavior is catalyzed by hostility towards self, while DSH behavior is catalyzed through an erratic and impulsive nature.

Two facets of neuroticism (Anxious Uncertainty and Self-Disturbance) as well as one facet of agreeableness (Distrustfulness) were not correlated with DSH engagement. Both of these findings are not consistent with hypotheses two. More specifically, all facets of neuroticism and low trust were expected to correlate with DSH engagement, as these facets have been shown to correlate with individuals with BPD (DeShong, Grant, & Mullins-Sweatt, 2019). Interestingly, low trust did not correlate with either DSH or NSSI engagement (see Table 4.1). This is a different finding from a previous study on NSSI and personality among an undergraduate population (MacLaren & Best, 2010). A possible explanation for these findings is that the short form of the survey was used in the present study. Provided more questions, it is possible that higher associations between DSH engagement and neuroticism and agreeableness would be realized.

As for function, NSSI engagement function for this study matched similarly with a previous study of adolescents (see Figure 5.1). The highest reported category of reasoning was automatic negative reinforcement, followed by automatic positive reinforcement, social positive reinforcement, and social negative reinforcement, respectively. One interesting difference was that the reports for three out of the four social negative reinforcement items were several magnitudes higher than the adolescent study. This difference could be explained by the differing types of individuals who participated in each study. The current study surveyed only college freshmen, who may not have as strong ties to their community as adolescents do. Additionally, the data collection timeline took place during the initial shutdown period of the COVID-19 outbreak in the United States. This period of social isolation could have further reinforced less social tendencies among the participant sample.

Reasons Reported For NSSI Engagement is Similar Across Studies

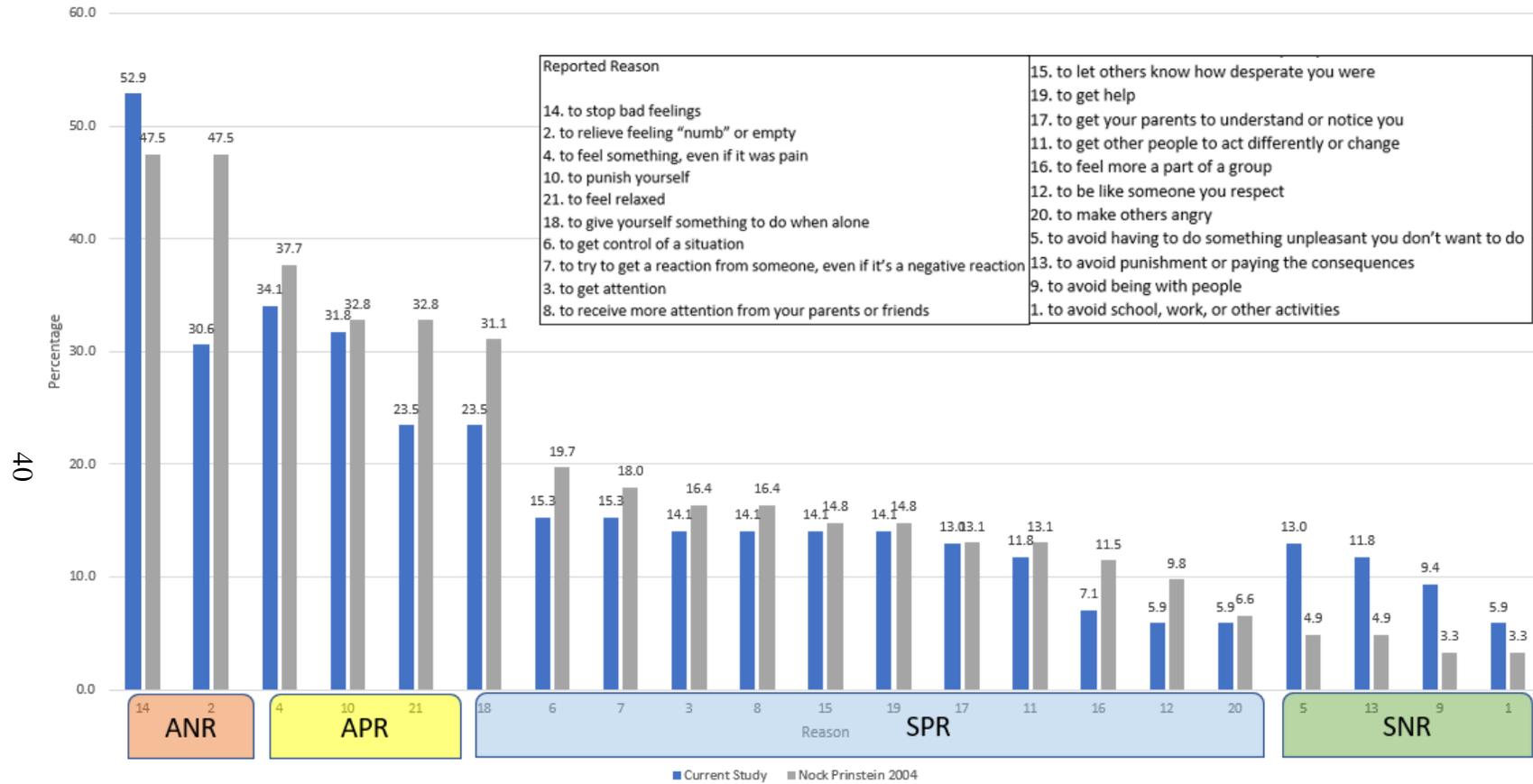


Figure 5.1 Comparing NSSI and DSH Engagement Functions

ANR = Automatic Negative Reinforcement.

APR = Automatic Positive Reinforcement.

SPR = Social Positive Reinforcement.

SNR = Social Negative Reinforcement

There was a contrast between individuals who admitted to DSH depending on the measure used. Specifically, individuals who denied any previous self-cyberbullying during the FASM admitted to previous DSH during the CDS. In total, only three individuals admitted to engaging in DSH on the FASM, whereas 17 individuals admitted to engaging in DSH on the CDS. There are several potential reasons for this discrepancy in the measures. One is that part A of the FASM lists 13 separate self-harm behaviors, and the DSH behaviors are listed near the end of the measure. Individuals may have experienced mental exhaustion or fatigue by the time they reach the DSH questions and may not fully process it. Future studies should consider arranging the DSH questions so that they are closer to the beginning of the part A of the FASM. Another reason may be related to the unfamiliarity of self-cyberbullying. This is an issue that has been experienced in a previous study (see Patchin & Hinduja, 2017). A separate item on the FASM was listed to account for this unfamiliarity, but it is possible that the extra DSH item was not specific enough to elicit association. Future studies should consider different detailed descriptions of DSH for part A of the FASM.

Methods to detect digital self-harmers should also be prioritized in future studies. Recent technology has made pattern detection across different online content more viable. In particular, natural language processing models that utilize differences in stylometry and other linguistic characteristics have been used to sift through online chats in order to identify the user. One study developed a system using multiple machine learning methods to identify cyberbullying perpetrators on Twitter to a 93% accuracy (León-Paredes et al., 2019). Another study found 70-75% accuracy across four different machine learning models: gradient boost, random forest, logistic regression, and support vector machines (Sahay et al., 2018). Using artificial intelligence models such as these, users could be identified across accounts, increasing the likelihood of connecting anonymous digital self-harm accounts with their primary accounts.

5.1 Limitations

There were several limitations in this study. The data collection for this current study was impacted based upon the recent events of COVID-19. This history effect presented several limitations for recruitment and participation. With regards to recruitment, several professors who were invited to distribute recruitment material were unwilling to distribute and they cited the increased stress from the ongoing COVID-19 pandemic. As a result, the overall sample size was not as large as the researchers desired. This may have contributed to low statistical power and low

effect size. Studies conducted in the future should attempt to add to the results of the present study with a larger sample size. For participation, the data collection took place during a time when residential students were forced to move-off campus. In addition to adding stressors to their lives, this may have inhibited the completion of the survey given that Internet connectivity may not be stable or present off-campus for the potential participants. Another limitation for this study was that since all of the data was collected from an online survey platform, there may have been selection bias among the participants of the study. Additionally, there are different types of DSH and potentially those yet to have been studied. Given the dearth of literature on DSH, there were not many examples of types of DSH from previous studies. Consequently, the items listed for DSH in the FASM and CDS may not be comprehensive of all variations of DSH. Finally, most NSSI behavior typically originates during an individual's adolescent years (Skegg, 2005). Future studies would benefit from using a younger population as the study sample.

5.2 Conclusion

This study shines a light on a new type of self-harm, digital self-harm (DSH). There are similarities and differences in its presentation compared with non-suicidal self-injury (NSSI) regarding personality traits and reasonings for individuals who engage in each behavior. In this study, it was shown that individuals will very likely engage in both NSSI and DSH. These findings have larger implications for analyzing adolescent behavior among clinical practitioners, teachers, educators, and parents. It is possible that DSH behavior may help identify individuals who are vulnerable to future NSSI behavior. Similarly, it is also possible that NSSI behavior is a precursor to DSH. Both of these possibilities emphasize the importance of thinking about the online behavior of adolescents and how it translates into the real world.

Another important step that would help expose DSH behavior would be to include the description of the behavior in the following edition of the DSM. NSSI behavior is already part of the criteria that clinicians use to diagnose borderline personality disorder (APA, 2013). NSSI is part of the Conditions for Further Study section, and it should be imperative to include DSH alongside NSSI. This could encourage clinical practitioners to seek out questionnaires that would reveal the prevalence of negative online behaviors amongst adolescents and young adults. It is the hope of these researchers that this study can provide an impetus to dedicate more resources towards the study and understanding of DSH.

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APPENDIX A. OSF SUBMISSION

Date registered

March 11, 2020

Registered from

osf.io/sm964

Preregistration Template from AsPredicted.org

Data collection

Have any data been collected for this study already? Note: 'Yes' is a discouraged answer for this preregistration form.

No, no data have been collected for this study yet.

Hypothesis

There are several hypotheses being tested in this study. They are as follows:

- H1: Individuals who engage in traditional forms of NSSI are more likely to engage in digital self-harm.
- H2: Individuals who engage in digital self-harm will score higher on all facets of Neuroticism, and lower on certain facets of Agreeableness and Conscientiousness.
- H3: Individuals who engage in digital self-harm will report higher intrapersonal reinforcement functioning than interpersonal reinforcement functioning.

Dependent variable

The key dependent variables are:

- Five-Factor Model personality characteristics.
- This will be measured using a short-form measure of the Five Factor Borderline Inventory.
- The prevalence of self-harm and digital self-harm

- For individuals who report engaging in the behavior, what are the functions of self-harm and digital self-harm
- Both prevalence and function will be assessed using an adapted version of the Functional Assessment for Self-Mutilation
- The types of digital self-harm that individuals engage in
- This will be measured using an adapted version of the Cyberbullying Deviancy Scale

Conditions

How many and which conditions will participants be assigned to?

There will be the following 3 conditions:

- Engaged in self-harm, but not digital self-harm
- Engaged in digital self-harm, but not self-harm
- Engaged in both self-harm and digital self-harm

Analyses

Correlations will examine the relationship between personality traits and self-reported engagement in digital self-harm, the relationship between traditional forms of self-harm and digital self-harm, as well as the relationship between personality traits and self-reported engagement in traditional forms of self-harm.

A regression model for digital self-harm will be examined, based on findings from the correlational analyses.

Outliers and Exclusions

To define outliers, the following data analysis will be conducted. First, descriptive statistics will reveal problematic outliers via scatterplots, box plots, and z-scores. Outliers will be removed (only if less than 5% of data), then descriptives will be conducted again, and compared, to the original exploration. If less than 5%, and the data is improved, the outliers will remain deleted. If more than 5%, then only the extreme outliers (>3.29 z-score) will be examined and deleted. Data transformation will not occur.

Sample Size

A correlation a priori power analysis was run to determine the sample size for this study. The software G*Power was used for this calculation. The input parameters for the power analysis was: one-tailed, effect size of 0.1, α error probability of 0.05, and a Power of 0.95. The output parameters determined that a sample size of 1073 would be necessary to achieve these input parameters.

Other

No.

Name

Real World vs. Online Behaviors

This study will investigate the prevalence of digital self-harm in a sample of undergraduate freshmen at a large, Midwestern university.

APPENDIX B. CONSENT FORM

IRB Research Protocol Number: 2020-158

RESEARCH PARTICIPANT CONSENT FORM

“Real World vs. Online Behaviors”

Principle Investigator: Kathryn Seigfried-Spellar, PhD
Computer & Information Technology
Purdue University

Key Information

Please take time to review this information carefully. This is a research study. Your participation in this study is voluntary which means that you may choose not to participate at any time without penalty or loss of benefits to which you are otherwise entitled. You may ask questions to the researchers about the study whenever you would like. If you decide to take part in the study, you will be asked to sign this form, be sure you understand what you will do and any possible risks or benefits.

The study is about real world and online behaviors. The study is being conducted to better understand the differences between real world and online behaviors. The data for this study will be collected over the course of several months.

What is the purpose of this study? The purpose of this study is to survey individuals’ online behaviors and compare and contrast them with behaviors in the real world. We would like to enroll 1,500 people in this study.

What will I do if I choose to be in this study? The anonymous, online survey will be administered using a secure website. Once you have read this consent form, and agree to voluntarily participate, you will be taken to a secure website to complete the online survey. You may withdraw from the survey at any time and you may skip or decline any questions that you do not wish to answer.

How long will I be in the study? Most people take about 15 minutes to complete the survey.

What are the possible risks or discomforts? The risks to you are minimal. They are not greater than those ordinarily encountered in daily life. Please know that this is an anonymous survey that uses a secure link. The survey is anonymous because we will not be able to link your responses back to you – we do not ask for any identifiable information (Ex. name). While completing the survey, the only risk to you might be if someone were to see your responses to the survey, so we recommend that you take this survey when you have complete privacy. Since the survey is anonymous, no one will know that you completed this survey unless you personally tell him or her, so breach of confidentiality is a risk and the safeguards used to minimize this risk can be found in the confidential section below.

It is difficult to predict the effects that surveys can have on participants’ mental health. In the instance where surveys induce significant psychological distress, Purdue offers several counseling

resources. Counseling & Psychological Services (CAPS) can be reached at (765) 494-6995. The Purdue Counseling and Guidance Center (PCGC) can be reached at (765) 494-9738.

Breach of confidentiality is always a risk with data, but we will take precautions to minimize this risk as described in the confidentiality section.

Are there any potential benefits? There are no direct benefits to you. Eventually, we hope to publish the research results, and if you want to see them, you should send an email requesting information to the Principal Investigator at kspellar@purdue.edu.

Will I receive payment or other incentive? If you are taking the course as a student in PSY 120, you will receive 1 experimental credit upon completion of the study. Otherwise, there is no compensation.

Are there costs to me for participation? There are no anticipated costs to participate in this research.

Will information about me and my participation be kept confidential?

The project's research records may be reviewed by departments at Purdue University responsible for regulatory and research oversight.

We do not ask for your name or any other information that could be used to identify you at any time before, during, or after the survey. No IP addresses will be recorded. There will be no way to determine where the survey was taken or by whom. Instead, the survey software will randomly assign an ID number to your responses. This means that the responses to the questionnaires cannot be linked or matched to you, which means your responses will remain completely anonymous. Only researchers associated with this study will have access to the data. In addition to the data being anonymous, it will be stored electronically in an encrypted format. The encrypted data will be kept indefinitely and will be used only for research purposes. Breach of confidentiality is always a risk with data, but we will take precautions to minimize this risk as described in the confidentiality section. EXCEPTION: If you are under 18 years your data will be destroyed and will not be used for research because we do not have parental consent for your participation. Thank you, however, for participating in the research as a learning experience.

What are my rights if I take part in this study?

You do not have to participate in this research project. If you agree to participate, you may withdraw your participation at any time without penalty.

Who can I contact if I have questions about the study? If you have questions, comments or concerns about this research project, you can talk to one of the researchers. Please contact Dr. Kathryn Seigfried-Spellar at 765-494-2439.

To report anonymously via Purdue's Hotline see www.purdue.edu/hotline

If you have questions about your rights while taking part in the study or have concerns about the treatment of research participants, please call the Human Research Protection Program at (765) 494-5942, email (irb@purdue.edu) or write to:

Human Research Protection Program - Purdue University
Ernest C. Young Hall, Room 1032
155 S. Grant St.
West Lafayette, IN 47907-2114

Documentation of Informed Consent.

I have had the opportunity to read this consent form and have the research study explained. I have had the opportunity to ask questions about the research study, and my questions have been answered. I am prepared to participate in the research study described above. If I wish, I may print this form for my records. If you agree, please click on the “I Agree” button below. Otherwise, we thank you for your time and ask that you click on the “I Do Not Agree” button.

I Agree

I Do Not Agree

APPENDIX C. DEBRIEFING FORM FOR PSY 120

Debriefing for Real World vs. Online Behaviors Study as posted on Sona Systems

1. What is the general aim of this research?

State the larger goal of this line of research.

The general aim of this research is to better understand the relationship between traditional and non-traditional forms of self-harm.

2. Is this correlational or experimental research?

If the study is experimental, name and describe one independent variable and one dependent variable. If the study is correlational, name and describe the two variables that you will be correlating. State your prediction or expected result.

The current study is correlational research. The two variables that I will be correlating is the relationship between traditional and non-traditional forms of self-harm and personality characteristics. I predict that individuals with personality characteristics that map to high Neuroticism, low Agreeableness, and low Conscientiousness will be more likely to engage in self-harming behaviors, both traditional and non-traditional forms.

3. What topic in introductory psychology does this research illustrate?

The research for the current study is related to personality and personality disorders.

In the King textbook, students can refer to Chapter 10, Personality, and Chapter 12, Psychological Disorders. In the Spielman textbook, students can refer to Chapter 11, Personality, which begins on page 365. Students using the Spielman textbook can also refer to section 10 of Chapter 15, Psychological Disorders (15.10). The section is titled Personality Disorders and it begins on page 578.

Link the research to a specific topic that is covered in the introductory psychology texts. Be sure to cite specific page numbers for every text that is in use.

4. Where can I learn more about this type of research?

Students can refer to either:

Chapter 10 in King, Laura. (2019). *Experience Psychology* (Fourth Edition). McGraw-Hill Education. Connect Access Card

- If their PSY 120 instructor is Dr. Erin Sparks Ward

- or -

Chapter 11 in Spielman, R.M., Dumper, K., Jenkins, W., Lacombe, A., Lovette, M., Perlmutter, M., (2014). *Psychology*. Houston, Tx: OpenStax; ISBN-13: 978-1938168352

- If their PSY 120 instructor is Dr. Colin William

The phenomenon known as digital self-harm has only been recently studied. To learn more, see the following two references:

1. Patchin, J. W., & Hinduja, S. (2017). Digital self-harm among adolescents. *Journal of Adolescent Health, 61*(6), 761-766.
2. Englander, E. (2012). Digital self-harm: Frequency, type, motivations, and outcomes. Retrieved from <http://webhost.bridgew.edu/marc/DIGITAL%20SELF%20HARM%20report.pdf>

5. Which faculty member is supervising this research and how can I contact her/him?

The faculty member who is supervising this research is:

Kathryn C. Seigfried-Spellar

Phone: 765-494-2439

Email: kspellar@purdue.edu

More information: <https://polytechnic.purdue.edu/profile/kspellar>

6. How long has the investigator been studying this specific topic and how does this experiment fit into the investigator's program of research?

Dr. Seigfried-Spellar has been studying cyber deviance for 10 years. The faculty member specializes in cyber criminal behavior and personality characteristics.

A lot of research in psychology depends on the participation of individuals like yourself. We're very grateful for your help. Thank you very much for participating.

APPENDIX D. SURVEY

Five Factor Borderline Inventory - Short Form (Adapted)

Please read all these instructions carefully before beginning. The following statements deal with how you think, feel, and act. Please read each item carefully and select the item that best corresponds to your agreement or disagreement. There are no right or wrong answers, and you need not be an expert to complete this questionnaire.

Disagree strongly A	Disagree a little B	Neither agree nor disagree C	Agree a little D	Agree strongly E
---------------------------	---------------------------	------------------------------------	------------------------	------------------------

1. I tend to be quite anxious.
2. I have had quite a few angry outbursts.
3. I sometimes feel worthless.
4. I can be so different with different people that it's like I'm not the same person.
5. I frequently have urges to do things that get me into trouble.
6. My emotions can spiral out of control.
7. Harming myself is one of the few ways I can tolerate my emotions.
8. I have felt that things were unreal and I was detached from life.
9. I am often distrustful of other people.
10. I sometimes do things I shouldn't to get people to do things I want or need.
11. I tend to get into lots of arguments.
12. I get into trouble because I don't think things through.
13. I worry a great deal.
14. My anger often feels out of control.
15. I have thought about ways to kill myself.
16. I can be so different with different people that I wonder who I am.
17. Sometimes I let myself get swept away by my urges.
18. I don't seem to have much control over how I feel.
19. I have threatened to commit suicide.
20. Sometimes I feel like I am no longer connected to my body.
21. It's really hard for me to trust people
22. Other people have called me manipulative.
23. I will make threats to get people to do things.

24. I tend to act quickly without thinking things through.
25. I worry a lot about people leaving me.
26. My anger at times gets the better of me.
27. I often feel sad.
28. I tend to feel like I don't belong with anyone.
29. When I am upset, I often do things that later cause me problems.
30. My mood shifts rapidly from one feeling to another.

31. Even minor setbacks can cause a great deal of drama in my life.
32. I sometimes feel like I am not real.
33. People are not as loyal to me as I wish they were.
34. I have been known to massage the truth to get my way.
35. I often get into arguments with people who are close to me.
36. Others have said that I do not think before I act.
37. I worry a lot about things that are out of my control.
38. My anger has at times gotten me into trouble.
39. I have thought about suicide since before I became a teenager.
40. I often feel like an outcast.
41. I have done a lot of things impulsively that I later regret.
42. I have a difficult time controlling my mood.
43. I don't think I can continue to live like this
44. I sometimes feel that nothing is real.
45. I have not been able to trust some of my closest friends.
46. At times you have to be dishonest and manipulative to get what you need.
47. I am easy to get along with.
48. I've done some pretty bad things on impulse.

Adapted:

Question 39 was adapted.

Original: I have thought about suicide since I was a teenager.

New: I have thought about suicide since before I became a teenager.

See: DeShong, H. L., Mullins-Sweatt, S. N., Miller, J. D., Widiger, T. A., & Lynam, D. R. (2016). Development of a short form of the five-factor borderline inventory. *Assessment, 23*(3), 342-352.

Functional Assessment of Self-Mutilation (Adapted)

A. In the past year, have you engaged in the following behaviors to deliberately harm yourself (check all that apply):

	No	Yes	How many times?	Have you gotten medical treatment?
1. cut or carved your skin				
2. hit yourself on purpose (e.g., broken your own bones, banged your head against something)				
3. pulled your hair out				
4. gave yourself a tattoo				
5. picked at a wound				
6. burned your skin (e.g., with a cigarette, match or other hot object)				
7. inserted objects under your nails or skin				
8. bit yourself (e.g., your mouth or lip)				
9. picked areas of your body to the point of drawing blood				
10. scraped or scratched your skin, to the point of bleeding				
11. "erased" your skin (e.g. using bleach)				
12. anonymously posted a mean comment about yourself online				
13. anonymously cyberbullied yourself				
14. other: _____				

B. If not in the past year, have you EVER done any of the above acts?

_____ Yes
 _____ No

If yes to any of the above behaviors in the past year, please complete the questions (C-H) below:

*** Note: survey logic flow in Qualtrics will only show parts C-H to participants who answered yes to any of the above behaviors.

C. While doing any of the above acts, were you trying to kill yourself?

- Yes
- No

D. How long did you think about doing the above act(s) before actually doing it?

- none
- "a few minutes"
- < 60 minutes
- > 1 hour but < 24 hours
- more than 1 day but less than a week
- greater than a week

E. Did you perform any of the above behaviors while you were taking drugs or alcohol?

- Yes
- No

F. Did you experience pain during this self-harm?

- severe pain
- moderate pain
- little pain
- no pain

G. How old were you when you first harmed yourself in this way? _____

H. Did you harm yourself for any of the reasons listed below? (check all reasons that apply):

0 Never	1 Rarely	2 Some	3 Often
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Reasons:	Rating
1. to avoid school, work, or other activities	
2. to relieve feeling "numb" or empty	

3. to get attention	
4. to feel something, even if it was pain	
5. to avoid having to do something unpleasant you don't want to do	
6. to get control of a situation	
7. to try to get a reaction from someone, even if its a negative reaction	
8. to receive more attention from your parents or friends	
9. to avoid being with people	
10. to punish yourself	
11. to get other people to act differently or change	
12. to be like someone you respect	
13. to avoid punishment or paying the consequences	
14. to stop bad feelings	
15. to let others know how desperate you were	
16. to feel more a part of a group	
17. to get your parents to understand or notice you	
18. to give yourself something to do when alone	
19. to get help	
20. to make others angry	
21. to feel relaxed	
22. other:	

See: Lloyd, E. E., Kelley, M. L., & Hope, T. (1997, April). Self-mutilation in a community sample of adolescents: Descriptive characteristics and provisional prevalence rates. In *annual meeting of the Society for Behavioral Medicine, New Orleans, LA*.

Cyberbullying Deviancy Scale (Adapted)

Please answer the following questions about yourself as honestly as you can. Remember, your responses will be kept confidential and anonymous. At no time will you need to disclose your identity, nor will you be asked to identify yourself.

For the following questions, “**online**” will mean any of the following: social media (such as Instagram, Snapchat, WhatsApp, and others) or anonymous online forums (such as Reddit, Formspring, 4Chan, Tumblr, and others).

Please use the following scale to answer the following questions:

Never	Once	2-3 Times	4-5 Times	6+ Times	Decline to Respond
1	2	3	4	5	6

In the past 5 years, have you ever used a real or fake account and:

49. Intentionally made online comments toward yourself in order to cause yourself distress?
50. Made teasing or frightening comments toward yourself online?
51. Posted pictures, information, or videos online that you knew would cause yourself embarrassment?
52. Created an online “bashing” poll in order to post rude or mean things about yourself?
53. Used profanity or insulting language towards yourself online?
54. Intentionally "outed yourself" online, regardless of whether it was true or not, to cause yourself harm?
55. Spread lies or hurtful rumors about yourself online?

APPENDIX D. RECRUITMENT MATERIAL

Email to Registrar Freshmen

Dear Purdue students:

Research has shown that real world behaviors can have a great effect on online behavior. The current study is a brief, 15-minute survey that examines the interactions between real world and online behaviors.

Participants must be 18 years of age or older. The survey is entirely anonymous. You will not be asked to provide any identifiable information.

Click here to take the survey:

https://purdue.ca1.qualtrics.com/jfe/form/SV_1BSjXSqNd9TqAsZ

This study is directed by Principal Investigator Dr. Kathryn C. Seigfried-Spellar, Ph.D. Dr. Seigfried-Spellar can be reached at kspellar@purdue.edu.

Thank you for your consideration.

Study Title: Real world vs. online behaviors

Protocol Number: IRB-2020-158

Dan Shao, B.A.

Graduate Student, Purdue University

Department of Computer & Information Technology

401 N. Grant St.

West Lafayette, IN 47907

(765) 494-4600

shao117@purdue.edu

Recruitment Flyer

Real world vs. online behaviors

Protocol Number: IRB-2020-158

Polytechnic Institute

Kathryn C. Seigfried-Spellar, Ph.D., Principle Investigator

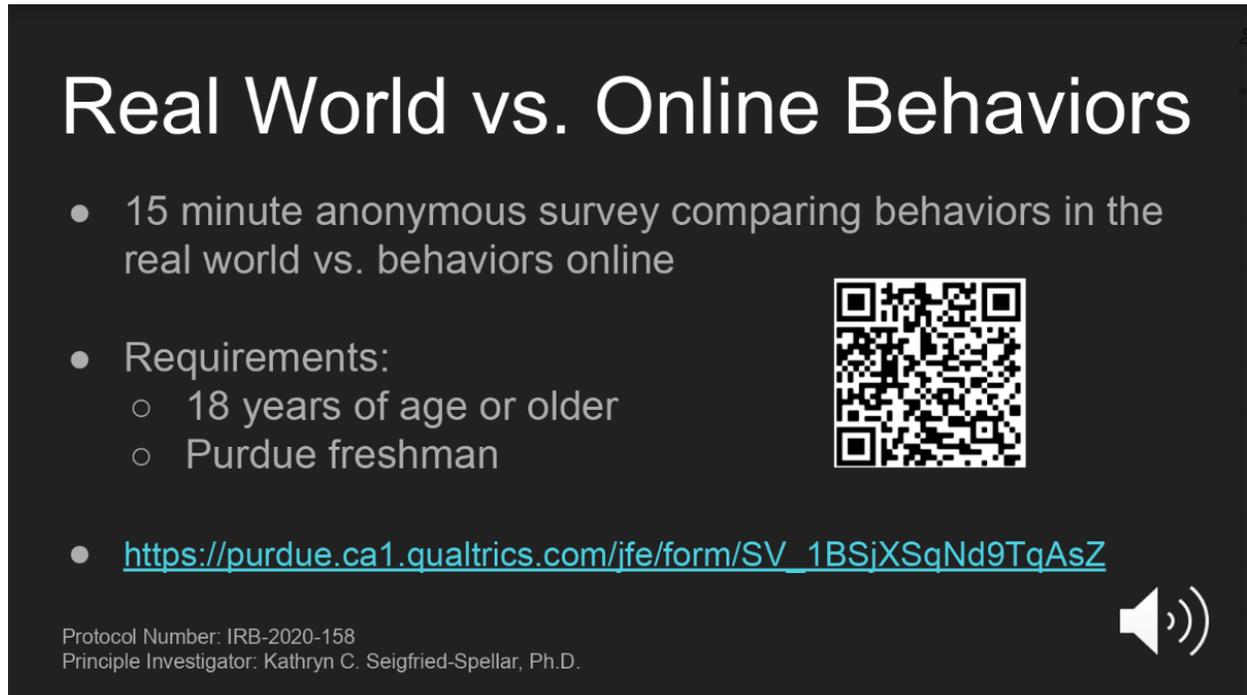
Seeking research participants for CNIT study

Researchers at Purdue University are seeking adults 18 years of age or older for a brief study about real world and online behaviors.

You do not need to provide any identifying information to participate. To see if you might qualify for the brief, confidential study, please use the QR code below or go to [\[https://purdue.ca1.qualtrics.com/jfe/form/SV_1BSjXSqNd9TqAsZ\]](https://purdue.ca1.qualtrics.com/jfe/form/SV_1BSjXSqNd9TqAsZ)



Recruitment Slide (audio not included)



Real World vs. Online Behaviors

- 15 minute anonymous survey comparing behaviors in the real world vs. behaviors online
- Requirements:
 - 18 years of age or older
 - Purdue freshman
- https://purdue.ca1.qualtrics.com/jfe/form/SV_1BSjXSqNd9TqAsZ

Protocol Number: IRB-2020-158
Principle Investigator: Kathryn C. Seigfried-Spellar, Ph.D.



Email to Professors

Subject:

Recruitment for Online Study

Body:

Dear Professor _____:

My name is Dan Shao and I am a graduate student in the Department of Computer & Information Technology. For my thesis, I am conducting an online study about real world and online behaviors. My goal is to recruit as many Purdue freshmen as I can.

I believe your course _____ is a great source of participants for my study. I have obtained approval from the Institutional Review Board (IRB) at Purdue to solicit participation from your class. I have created a slide with audio, the entirety of which is under 90 seconds long.

If you can help, please respond as soon as possible. I have attached the recruitment slide that you can distribute. There is audio attached to the slide. I am also attaching the IRB Approval Document associated with this study.

This study is directed by Principal Investigator Dr. Kathryn C. Seigfried-Spellar, Ph.D. Dr. Seigfried-Spellar can be reached at kspellar@purdue.edu.

Thank you for your consideration.

Study Title: Real world vs. online behaviors

Protocol Number: IRB-2020-158