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Binge-Watching and Its Correlates of Personality and Problematic Internet Use in a South African Sample

Zelal Kilic
Connecticut College, zkilic@conncoll.edu

The Influence of Self-Concept Clarity and Borderline Personality on Links Between Interpersonal Stress and Emotional Reactivity

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Zelal Kilic

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Abstract

Impairments in interpersonal functioning and identity are two of the core features of borderline personality disorder. To what extent self-concept clarity contributes to the relationship between interpersonal dysfunction and BPD is not yet known. With the centrality of social media in people's daily functioning, experiences of interpersonal dysfunction may very well occur on online platforms, but this context is not often studied with BPD yet. This study first sought to examine the interaction between BPD symptomatology and self-concept clarity in the context of a social media-based rejection stressor. It did so in a nonclinical sample, to develop a protocol that may be useful in future clinical studies. In an experimental study of emotional reactivity (objective and subjective) to simulated social rejection (social media based vs. not), it was found that individuals with higher BPD symptomatology showed greater psychophysiological reactivity to social rejection. Self-concept clarity did not moderate this pattern in the present study. Specific findings varied over reactivity measure and type of social rejection feedback, with social media-based rejection causing more reactivity in some cases. A secondary goal of the study was to assess how frequency of use of social media use might make individuals more reactive to social media-based rejection. It was found that individuals with higher social media usage showed higher psychophysiological reactivity when a social media stressor was presented. Both sets of findings, captured different aspects of interpersonal functioning relevant to the context of social media use in people with borderline personality disorder symptoms. The results of this study may be useful to inform future research and treatment focused on interpersonal functioning and borderline symptoms, both in clinical and non-clinical samples.

Keywords: self-concept clarity, borderline personality disorder, emotional reactivity, social media, peer-rejection, psychophysiological arousal

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Introduction

Interpersonal Functioning: Why does it matter?

Interpersonal functioning refers to interactions with our social surroundings and the provoked emotional and behavioral responses in light of these interactions (Baumeister & Vohs, 2004). The term "interpersonal" in interpersonal functioning encompasses this definition by highlighting both the interactive nature of relationships and the induced personal outcomes and internalization of feelings through this interactive component (Sullivan, 1953). While good interpersonal functioning (e.g. clear and accurate social cognition, skills of empathy, secure attachment styles) can protect people from developing psychopathology in the face of adversity, impairments in interpersonal functioning can trigger some disordered behaviors (e.g. lower emotion regulation, higher social anxiety, negative moods) and create risk for the emergence of psychological disorders (Carbonell et al., 2002; Goldbaum, Craig, Pepler, & Connolly, 2003). Thus, while interpersonal functioning can be a protective factor against psychological problems, it can also act as a risk factor due to the nature of the relationship between individuals and the social environment that they exist in, hence as a hallmark for psychopathology.

As social creatures, humans interact with their environments constantly and these interactions are interdependent both on the individuals themselves and the context of the social surroundings. There is a bidirectional relationship between interactions with the social environment and psychological well-being: how we function in our social environments has the potential to influence our mental states and our mental states impact how we interact with our social environment. Starting from early stages of life, social interactions influence cognitive, emotional and behavioral processes, help individuals form a sense of identity, and contribute to personality development. For instance, attachment theory suggests that early life relationships

with parents and/or primary caregivers lead to an integration of self and relationships with others as mental models (Bowlby, 1979; Gallo, Smith, & Ruiz, 2003). It further suggests that these mental models determine how people form relationships and interact with others later in life. While many studies show strong support for attachment theory and the idea of early relationships forming most of our understanding and processing of how social interactions work (Mikulincer & Shaver, 2003; Feeney & Noller, 1990; Kirkpatrick & Davis, 1994), others highlight the ongoing nature of interpersonal development.

Still centering the importance of interpersonal functioning, these other models highlight how cognitive flexibility allows individuals to evolve their understanding of self and social interactions. For instance, daily fluctuations in stress and social and/or environmental adversities have been shown to account for fifty percent of variance in interpersonal behaviors (Wright, Hopwood, & Simms, 2015), which reveals the context-dependent, fragile and adaptive nature of interpersonal behaviors. In addition to daily stressors, life stages also influence social identity development, causing shifts in interpersonal functioning at various stages. For instance, adolescence is a period that is highly marked by shifts in social circles and in the emotional value given to these social circles. Different experiences within a family, a friend group or a romantic relationship can shift the cognitive models that individuals have previously developed and influence their influences on interpersonal functioning (Tanti, Stukas, Halloran, & Foddy, 2011), especially in a sensitive stage like adolescence. These findings highlight different ways in which characteristics of social functioning are formed and altered throughout the lifespan depending on the quality of the social environment. Therefore, although early relationships shape a working model of how relationships operate early in life, later on social relationships, stressors, and interpersonal roles can change how and why people engage in relationships in certain ways. This

malleable concept of social flexibility not only affects the way people function in their social circles, but also contributes to the bidirectional nature of the relationship between interpersonal functioning and psychological well-being.

Many psychiatric disorders involve problems in social functioning. For instance, interpersonal dysfunction and frequently experiencing challenges in social interactions have been shown to have a strong association with depression (Petty, 2004). Interpersonal difficulties serve both as a precipitating factor influencing the severity of depression and as an outcome of the state of depression. Schizophrenia, a disorder of poor insight, is also marked with deficits in social functioning. Cognitive dysfunctions (disorganized thoughts, working memory problems etc.) correlate with impairments in social functioning and with lower levels of effort to compensate for those impairments (Bowen et al., 1994). This suggests that not only do individuals with schizophrenia go through interpersonal challenges, they also have a lower capacity to recover from those challenges. In many other realms of psychopathology, such as eating disorders (Arcelus, Haslam, Farrow, & Meyer, 2013), post-traumatic stress disorder (Cloitre, Miranda, Stovall-McClough, & Han, 2005), and social anxiety (Alden & Phillips, 1990), impairment in interpersonal functioning is shown to be both a frequent cause and a prevalent symptom of psychopathology.

For the purposes of this literature review, there will be a focus on interpersonal functioning in the context of borderline personality disorder (BPD), and its causes, correlates and effects will be examined. Research and theory from multiple fields including BPD, depression, self-harm and identity development will be examined to understand how certain aspects of identity can act as a risk factor for or a protective factor against psychopathology, specifically BPD. As BPD is a disorder that is highly marked with impairments in interpersonal functioning

and identity disturbance, the interactions among BPD symptom severity, identity disturbances and interpersonal impairment will be investigated to see the interplay among these variables. Specifically, the influence of self-concept clarity and identity disturbance in the face of peer rejection on emotion regulation will be examined.

Since interpersonal functioning is a central component of our lives and can impact our cognitions and emotions, the first half of the literature review will address impairments in interpersonal functioning in individuals with BPD to understand how they contribute to the development of the disorder. This perspective will be examined by looking at BPD symptoms as well as BPD correlates of depression and self-harm to further understand the clinical and practical implications of the disorder. Then, a specific focus will be placed on the understanding of self and identity in relation to others, as BPD is marked by deficits in a sense of self. Deficits and impairments in certain identity constructs, especially self-concept clarity, will be examined as they are crucial to understanding the nature of BPD. Lastly, to bring a new perspective to these variables, the context of social media will be examined as a new interpersonal landscape in which difficulties with self-concept clarity and other BPD symptoms may further disrupt interpersonal functioning and psychological well-being.

Interpersonal Functioning in Borderline Personality Disorder

Borderline personality disorder (BPD) is mainly characterized by varying images of self, as well as mood and emotion dysregulation (Crowell, Beauchaine, & Linehan, 2009) and has a lifetime prevalence of 5.9% (Grant et al., 2008). According to DSM-5, impairment in interpersonal functioning is a core component of BPD as individuals might lack empathy, show lower ability to recognize emotions and thoughts of others, and/or have unstable and insecure intimate relationships that are highly marked with fear of abandonment, mistrust and

anxiousness. Linehan (1993) clusters borderline symptoms into five categories. The main category involves emotion dysregulation and instability: emotional responses to stressors are much more reactive than what is typically expected. In turn, many Axis I disorders (e.g. mood and anxiety disorders) may arise when emotion dysregulation is consistent, which explains the high comorbidity of BPD. Individuals with BPD might also struggle with high impulsivity and extremely destructive behaviors due to uncontrollable urges to act on intense momentary emotions. In response to stressful situations, people with BPD might also show cognitive dysregulation in forms of psychotic-like symptoms such as delusions, depersonalization and dissociation. Sense of self is another area of impairment in individuals with BPD as they might report feelings of emptiness or not knowing who they actually are. These domains of dysfunction present the hardships that characterize BPD and explain why individuals with BPD may experience intense neediness and high sensitivity to rejection in their social interactions.

Many different theories have been proposed in order to explain the causes behind interpersonal dysfunction in BPD. For instance, attachment theorists suggest that early life relationships shape cognitive models of how relationships should work and that they influence individuals' relationships for the rest of their lives. Object relations theorists argue that some individuals with BPD experience a sense of split within themselves and between self and others because good and bad representations of self and others are extremely "split-off" from one another. This brings in a fragmented sense of self as they do not feel like they are the same people across contexts (Kernberg, 1995; Yeomans & Levy, 2002). This polarized and altering sense of self gets reflected in social interactions as individuals with BPD experience quickly alternating feelings of affection and aggression towards others, thus, have trouble regulating their reactivity and forming bonds.

Linehan's biosocial theory of borderline personality disorder is one of the most prominent theories investigating the interplay between genetics and the social environment in the development of BPD. She suggests that BPD is primarily a disorder of emotion dysregulation and emerges from transactions between individuals with biological vulnerabilities and specific environmental influences (Crowell et al., 2009). This suggests that adverse social environments and situations can result in poorer emotion regulation skills, and more emotional reactivity in biologically susceptible individuals. Proneness to higher sensitivity to social difficulties may result in overreacting and more difficulties recovering from this overreactivity. Inevitably, this proneness causes more impairments in both social and daily functioning as it prevents social adjustment to unexpected situations.

Dysfunctional relationships cause impairments in daily life for individuals with BPD because they lack problem solving skills and cannot deal effectively with interpersonal conflicts. In a study done by Dixon-Gordon, Chapman, Lovasz, & Walters (2011), it was found that individuals with higher BPD symptoms came up with less relevant and appropriate solutions to social problems than a lower BPD group when they went through a negative mood induction. Results further suggested that the more self-reported negative mood individuals with BPD experienced, the less effective their social problem-solving skills were. Ineffective problem-solving skills are fueled by poorer emotion regulation choices in individuals with BPD. For instance, self-destructive behaviors (e.g. self-harm, self-injury, suicidality) in the face of a social conflict or peer rejection are common responses and coping strategies to deal with stressors. This worsens social maladjustment (Brodsky, Groves, Oquendo, Mann, & Stanley, 2006; Brown, Comtois, & Linehan, 2002), due to the extreme negative affect that is induced by these behaviors.

Studies in neuroscience also offer support to these findings that interpersonal functioning is particularly impaired in BPD. For instance, the medial prefrontal cortex, an area that is related to many social cognitive processes such as behavioral inhibition, theory of mind processes and impulsivity, has been shown to be hyperactivated during social exclusion tasks in individuals with relatively high BPD symptoms in a nonclinical population (Ruocco et al., 2010). Increased reactivity has been linked to emotion regulation areas in the brain such as the orbitofrontal cortex and amygdala. In addition, New et al. (2012) found that individuals with BPD showed less activation in the dorsal prefrontal cortex which shows they might have trouble controlling their aggression when a social stressor is present. In short, individuals with BPD lack activation in emotion regulation centers of the brain and they lack the control to compensate for poor emotion regulation. In another study done by Mier et al. (2013) it was found that BPD patients showed less activation in their mirror neuron system and more activation in their amygdala compared to healthy controls when they were engaging in a social-cognitive task measuring their ability to understand emotions. Thus, they experience more emotional enhancement during interpersonally relevant tasks that can result in emotional reactivity, but they lack theory of mind skills to help them identify what others are going through. Therefore, from developmental, cognitive, behavioral, and biological perspectives, emotional reactivity is heightened in individuals with BPD, and also in individuals with higher BPD severity, in the face of social stressors. Two other prominent clinical correlates of BPD, depression and self-harm, with a focus on interpersonal functioning will be further investigated next.

Depression

Due to the complex nature of BPD, studies focusing on clinical samples have found higher rates of substance use, mood and anxiety disorders in individuals with BPD compared to

controls (Skodol et al., 1999; Zanarini, Gunderson, & Frankenburg, 1989). There is especially a strong comorbidity between BPD and mood disorders; approximately 75% of individuals with BPD also meet the criteria for mood disorders (Grant et al., 2008). Depression, in particular, has been shown to be highly correlated with BPD, as 41-83% of BPD patients report a history of major depression and 12-39% report dysthymia (persistent depressive disorder; Grant et al., 2008). Causes of this co-occurrence are unclear; they may stem from various underlying processes: certain risk factors together or separately may lead to comorbidity, or symptoms of one disorder may prompt the symptoms of the other one (Köhling, Ehrenthal, Levy, Schauenburg, & Dinger, 2015). Therefore, it is important to investigate how depression might intensify some symptoms or experiences of BPD in times of comorbidity.

Regardless of the pathway to comorbidity, the affective and interpersonal nature of BPD influences the experience of depression in individuals diagnosed with BPD who also experience depressive symptoms. Hyperreactivity to interpersonal conflict, fear of abandonment, negative affect towards oneself and others are common triggers for feelings of loneliness and isolation, often associated with depression and may become more severe (Köhling et al., 2015). For instance, Zanarini and Frankenburg (2007) explain that there is a multifaceted inner pain that forms the core component of BPD. They also suggest that emotions are usually experienced at a more extreme end in people with BPD. Thus, the magnitude of induced negative affect caused by interpersonal dysfunction can result in severe symptoms of depression with BPD because any negative affect will be experienced at the extremes.

On its own, depression is a disorder that is highly influenced by social impairment. Depression alone can aggravate impairments in social functioning and interfere with interpersonal relationships because it is a disorder that is mainly associated with having low

moods and anhedonia (loss of interest in regular activities), and feelings of inappropriate guilt or worthlessness (Rosenström & Jokela, 2017). For instance, due to anhedonia and feelings of sadness, individuals will lose interest in their regular social cycles or not be active enough to participate in possible new social environments. These processes can reinforce cognitive biases that might worsen social isolation and loneliness. Similarly, with feelings of inappropriate guilt or worthlessness, individuals might be biased to feel like they are inadequate or inferior, so they prefer to disconnect from others (Blatt & et al, 1982). Therefore, social avoidance and social withdrawal are some of the commonly seen behaviors in individuals with depression. These behaviors alone can trigger the development of interactive relationships among diminished social contact, strained social relationships and cognitive biases. They also have the potential to lead to seeking excessive social reassurance in others (Cruwys, Haslam, Dingle, Haslam, & Jetten, 2014) due to reduced social contact and feelings of inadequacy/inferiority when they co-occur with BPD. For instance, researchers found that in a nonclinical sample, individuals who have a tendency to ruminate and experience depressed mood more frequently experience dysregulated interpersonal behavior and more often have increased rates of reassurance seeking from others (Selby, Anestis, & Joiner 2008). This pattern is also consistent in clinical samples of individuals with BPD, especially when depression symptoms co-occur frequently: individuals with BPD have an intense interpersonal dependency and tend to fluctuate between social avoidance and reassurance seeking and these fluctuations are stronger when depression symptoms are present (Gunderson, 1996).

First to understand these interactions and overlaps, it is essential to address the possible cognitive biases that contribute to various social withdrawal symptoms in depression because the same cognitive biases are prevalent in BPD as in depression. The cognitive vulnerability model

of depression by Beck (2008) explains how a person might be more vulnerable to thinking about and perceiving social stimuli more negatively, and how this influences the risk of becoming depressed. Thus, there might be a preset negative filter that people with depression or at risk for depression look through when evaluating their social interactions. There are also negative self-referent biases that interfere with logical information processing and cause individuals to create negative automatic interpretations about themselves in any situation (Beck, 2008). Similarly, research has shown that in BPD, individuals are more susceptible to interpret neutral or ambiguous situations with a negative preset bias and find themselves faulty in stress-evoking social situations (Meyer, Pilkonis, & Beevers, 2004), potentially leading to similar experiences of stress induced by depression. This similarity between the two disorders might suggest higher rates of comorbidity since they potentially trigger one another.

Due to these cognitive vulnerabilities, there are certain self-perpetuating processes that directly influence social relationships in depression: negative feedback seeking, excessive reassurance seeking, and interpersonal conflict avoidance. Again, these processes are similar to BPD symptomology as well (Joiner, 2006). In both BPD and depression literatures, individuals have been shown to seek negative feedback due to their negative perceptions of themselves and the world around them. So, they might expect people to have the same level of negativity as they do because of the need to match their self-concept to others (Joiner, 2006). They might also excessively seek reassurance from others because of the need to feel worthy and likeable. However, most of the time, even though they get the reassurance that they seek, they still have a hard time believing it due to the preset negative cognitive filter (Dow & Craighead, 1987). There is a feeling of mistrust that prompts individuals to question whether people they interact with are honest with them, will reject them or negatively judge them (Barnow et al., 2009). Third, they

might avoid interpersonal conflicts because they lack assertiveness and the desire to engage in activities and relationships: this can result in social avoidance (Radke, Güths, André, Müller, & de Bruijn, 2014). Therefore, these processes can be very detrimental in interpersonal relationships not only because they intrude on intrapersonal well-being, but also because they impair people's mental representations of themselves in a negative way leading to feelings of worthlessness (Joiner, 2006). Thus, when these processes in depression occur in the context of BPD, they have the potential to aggravate the interpersonal symptoms of BPD.

As a consequence of these self-perpetuating processes, communication skills and perceptions of individuals suffering from depression might get dampened, causing less social context and environment. If depression is experienced in the context of BPD, due to the processes explained above, individuals might end up withdrawing themselves from people around them or people around them might stop tolerating some of the problematic social behaviors that they exhibit (Blatt & et al, 1982). For instance, on the one hand a person might feel the need to hold themselves back because they feel like a burden to others which would cause more severe feelings of loneliness due to social isolation. A person might think that social withdrawal is the best option to feel worthy in a relationship over other options such as getting attention through constant reassurance seeking. On the other hand, people around depressed individuals may feel the need to withdraw because they experience negative emotions around them. In support of this, Coyne (1976) showed that when healthy individuals interact with people with depression, they experience negative affect, causing them to want to get away from those with depression. In either case, a lack of social context forms and might be detrimental for individuals who experience interpersonal dysfunction across situations and time.

As depression is highly comorbid with BPD, it is important to assess to what degree social isolation and loneliness might worsen the experience of BPD symptoms. Since depression symptoms are strongly related to feelings of loneliness and lack of social support, these interpersonal impairments have the potential to aggravate the features of BPD. Many studies do indicate that depression gets worse as social withdrawal symptoms emerge because social support from peers, significant others, and families decreases (Lakey & Cronin, 2008). The importance of social support is especially highlighted when individuals face a social stressor. For instance, after a drastic change, such as a divorce, individuals who tend to build up more social networks can more easily manage stressors that come with that life changing event (S.E.Taylor et al., 2000). Therefore, having a strong support chain can mitigate the stress-inducing experiences of both depression and BPD, as it offers the ability to manage stressors much more easily than having a lack of social support.

Consequently, cognitive biases and less social context in the experience of depression have been shown to be highly associated with social impairment. Due to similar experiences of interpersonal dysfunctions in BPD and depression, when individuals with BPD experience symptoms of depression as well, the interpersonal aspect of BPD can become more severe and cause more reactivity in light of interpersonal stressors. Thus, in order to advance knowledge about emotional reactivity, it is important to investigate to what extent individuals with high BPD symptom severity experience depression symptoms.

Self-Harm

Self-harm is another strong correlate of borderline personality disorder and can be defined in terms of both suicidal behavior and non-suicidal self-injury (NSSI) in the context of BPD. Seventy-five percent of individuals with BPD report at least one suicide attempt in their

lifetime (Goodman et al., 2017), and many attempt more than one. Although NSSI and suicidality often co-occur and NSSI frequently predicts future suicide risk longitudinally (Ribeiro et al., 2016), NSSI distinctly refers to physically harming one's own body without the intention to die. Since personality disorders were first classified in the DSM in the 1980s until 2013, NSSI had been considered a symptom of BPD (American Psychiatric Association, 2013). Even though NSSI is now classified as a distinct phenomenon and is listed under "conditions for further study" in the DSM 5, clinicians and researchers continue to investigate it mostly in the context of BPD due to high comorbidity. For instance, 70-75% of individuals with BPD also engage in self-mutilative behaviors such as self-cutting, self-burning, hair pulling and skin picking (Gunderson & Ridolfi, 2006; Linehan, 1993).

NSSI serves as a relief method from intense negative emotions or tension in BPD patients (Brown et al., 2002). This dysfunctional coping strategy is used to regulate emotions and to deal with high reactivity particularly to interpersonal stressors. It is mostly associated with impaired interpersonal functioning (Turner, Cobb, Gratz, & Chapman, 2016), along with high emotional reactivity in general, poor emotion regulation skills and heightened sensitivity to social stimuli (P. J. Taylor et al., 2018). Thus, NSSI may stem from dysregulation of emotion in the face of socially adverse situations: people can use it as a way of communicating how "distressed," "desperate" or "hurt" they are, alternatively NSSI may be used to hurt or punish others, although this latter option has very low rates of serving as a catalyst for NSSI (P. J. Taylor et al., 2018).

Due to the high comorbidity of BPD and NSSI, it is important to assess to what extent interpersonal dysfunction accounts for NSSI behaviors. As an emotion regulation strategy, NSSI also has positive or negative social consequences. For instance, it can have an alleviating impact on loneliness because self-injury might be followed by increased social support, care and

attention. This increased positive social contact can, in turn, mitigate unwanted emotions or cognitions (Turner et al., 2016). Some social concerns such as loneliness, the need to be perfect around other people, and peer rejection and victimization have been associated with endorsement of NSSI behaviors (Hilt, Cha, & Nolen-Hoeksema, 2008). In a study done by Turner et al. (2016) interpersonal influence was found to be associated with controlling, intrusive and needy interpersonal styles in individuals with a history of NSSI. Furthermore, ineffective interpersonal communication was associated with a vindictive interpersonal style. These findings suggest that negative affect caused by malfunctions in social relationships can prompt NSSI type behaviors. Therefore, impairments in social functioning in individuals with NSSI are linked to underlying mechanisms of this behavior and to how it mitigates or worsens the features of BPD.

Self and Others

The theoretical framework of social cognitive theory suggests that the quality of human functioning arises from interactions of personal components and environmental factors (Bandura, 1977; Lewin, 1935). Beginning from early stages of life, humans interact with their surroundings. Through these interactions, a sense of identity forms and evolves and has the potential to contribute to how we form future bonds, interactions or relationships. Here, we aim to examine the interactive relationship between different aspects of self and identity development and interpersonal functioning and how they potentially influence each other.

First, many aspects of self predict aspects of interpersonal functioning such as emotion regulation, adaptation skills and secure attachment styles. For instance, higher self-control (ability to control one's emotions, behaviors and impulses) allows for flexibility to adapt to different social environments and challenges (Rothbaum, Weisz, & Snyder, 1982). This suggests that in the face of adversity, individuals showing higher self-control can be more adaptive and

protected against negative outcomes. This applies to interpersonal adaptations as well, as a result of the higher ability to control oneself in the face of adverse social reactions. In support of this view, a study by Tangney, Baumeister and Boone (2004) found that positive psychological adjustment, self-esteem, and stability of self-esteem over time and contexts were positively associated with higher self-control. Furthermore, they found a strong correlation between self-control and positive familial relationships, higher empathy skills, secure attachments and better anger management. This shows that self-control is not only associated with better psychological well-being on an intrapersonal level such as self-esteem, but also qualities that enhance interpersonal relationships such as empathy and anger management.

In bidirectional fashion, the quality of a person's interpersonal functioning and social interactions can shape many aspects of self throughout the lifespan. Most importantly, enhanced interpersonal relationships increase the quality of development of sense of self (Coopersmith, 1967) because sense of self is essentially a social product emerging from our extensive interactions. For instance, familial relationships, especially parental connections, influence levels of self-esteem and self-confidence in children because those relationships form an initial concept for identity: parental support, affection and encouragement help children exhibit higher confidence (Bachman & O'Malley, 1977). Through positive feedback and a sense of inclusivity from parents, children receive information about their inherent worth and directly help develop a secure attachment style which builds competency in later social functioning (Gecas & Schwalbe, 1986). Similarly, peer relationships especially in adolescence contribute to the self-concept of teens and may act as a buffer for psychopathology. As people expand their social circles over time peer relationships begin having a profound impact on psychosocial functioning, and self-beliefs start shifting depending on the feedback received. In a review by Parker and Asher

(1987), difficulties in peer relationships such as low acceptance, high aggressiveness or withdrawal symptoms have been associated with later social maladjustment and health risk-taking behavior. Relatedly, Buhrmester, Furman, Wittenberg and Reis (1988) found that people who are able to initiate relationships develop better conflict management, emotion regulation and emotional support. Thus, interpersonal difficulties can act as a risk factor in development, and positive interpersonal functioning can act as a protective factor. Therefore, different social bonds and relationships we have in different stages of life helps to form a sense of self that later influences interpersonal interactions.

Identity Disturbance in BPD

Since the earliest attempts to understand the nature of BPD, identity disturbance has been seen as a central and complex component of the disorder. Kernberg (1975) suggested that identity diffusion (figuring out who you actually are and who your real self is) in BPD dampens adjustments between alternate selves across contexts. This means that people with BPD have trouble switching from one identity to another in different social contexts, while retaining a clear and coherent sense of self, and this might create feelings of emptiness. Later, Adler & Buie (1979) viewed this as a sense of incoherence and losing control over the self and named it “self-fragmentation”.

As social identity theory emerged and brought the notion that our sense of identity forms with the influence of how other people view us, work around BPD focused on how individuals with BPD have a hard time understanding how others feel or act and have difficulty developing coherent identities based on how others view them (Wilkinson-Ryan, 2000). Now, identity disturbance is seen as a lack of coherence in the perception of self and is classified as a cause and

an outcome of interpersonal dysfunction due to lack of consistent relationships, big investments in insecure attachments and excessive reassurance seeking (Wilkinson-Ryan, 2000).

Due to this lack of coherence within self, many studies have shown that problems in identity and self-functioning can lead to other dysfunctions in BPD. For instance, in a 14-day long daily diary study, in a non-clinical student sample, participants who reported higher BPD symptoms reported lower self-esteem during the general duration of data collection. Furthermore, fluctuations in self-esteem along with other affective symptoms were more unpredictable and frequent than in people in the low BPD symptom severity group (Hochschild Tolpin, Cimbolic Gunthert, Cohen, & O'Neill, 2004).

Similarly, self-schemas, the way individuals perceive themselves, have been shown to be dysfunctional and more negative in BPD patients. A study comparing negative self-schemas in BPD patients, bipolar patients and healthy controls found that maladaptive schemas were significantly higher in BPD compared to participants with bipolar disorder or healthy control. Results suggested that individuals with BPD have higher rates of negative beliefs about themselves and their relationships with other people and this can contribute to dysfunctional beliefs and identity disturbances (Nilsson, Jørgensen, Straarup, & Licht, 2010). Another common issue in BPD is self-regulation and inability to control adverse emotions. These negative self-perceptions and schemas can increase the risk for self-criticism and self-punishment and people might feel prompted to engage in NSSI hoping to enhance self-protection and self-preservation as a form of emotion regulation strategy (Klonsky & Glenn, 2009; Nock, 2009).

Self-Concept Clarity

Although various concepts about the self and BPD have been reviewed above, self-concept clarity in particular warrants attention. Self-concept clarity refers to cohesion within

oneself about various aspects of personality and a range of behaviors across time and contexts (Campbell, 1990). According to this definition, self-concept clarity has the potential to tie into these bidirectional relationships between BPD and interpersonal dysfunction since the extent of congruence in self across contexts influences how people interpret and interact with the outside social world. As identity disturbance forms one of the core problems in BPD, it is inevitable that there is not a clear sense of self, both because for people with BPD self-concept is very dependent on what other people think of them and also because of the lack of cohesion between alternate selves (Meares, 2012). Due to the additive effects of negative self-schemas and self-criticism in BPD, self-concept clarity is thus an important subject to investigate in the context of BPD. Although they are intertwined concepts with potential to trigger one another, negative self-schemas refer to negative attributes that one assigns to oneself whereas higher self-criticism refers to cognitions and feelings of incompetency and inadequacy to a maladaptive extent (Vater, Schröder-Abé, Weißgerber, Roepke, & Schütz, 2015).

Research has shown that BPD patients have a more compartmentalized sense of self, meaning they have either very positive or very negative self-views and nothing in between. Negative self-views, specifically, have been shown to be increased compared to negative self-views in non-clinical and depression groups (Vater, Schröder-Abé, Weißgerber, Roepke, & Schütz, 2015), suggesting that the negative component of the self is much stronger than the positive component. Better self-concept clarity has been shown as a protective factor against self-harm when negative affect is induced (Scala et al., 2018). Likewise, lower self-concept clarity has been shown to be correlated with higher emotion dysregulation and as moderating the relationship between emotion dysregulation and self-harm (Lear & Pepper, 2016).

Furthermore, engaging in NSSI is also shown to be related to problems in self-concept clarity. For instance, Claes et al. (2014) found that identity synthesis, the extent to which individuals feel various aspects of identity fit together, was negatively related to engaging in NSSI. They also indicated that identity confusion explained some of the variance in NSSI engagement. In another study by Lear and Pepper (2016) using college students, self-concept clarity fully accounted for variance in emotion dysregulation with regard to NSSI method versatility. Considering the links between self-concept clarity to BPD features, and its correlates of depression and NSSI, self-concept clarity might also be linked to interpersonal functioning in the context of BPD. It is important to assess the degree to which it might account for the variance in emotional reactivity in response to a social stressor in individuals with high BPD symptomology.

Interpersonal Functioning and Self-Expression on Social Media

Most research on interpersonal functioning, and interpersonal functioning within BPD in particular, has focused on in-person social interactions. But the landscape of interpersonal interactions, and their implications for psychological functioning and well-being, have changed dramatically over time with cultural shifts toward continuous internet use, constant social comparison through social media, and unlimited access to thousands of lives every day (Haferkamp & Krämer, 2011). Online threats and comparisons that people come across contribute to their daily functioning either by motivating them or discouraging them. There are some studies that report increased self-esteem related to online social interactions contributes to positive well-being (Gonzales & Hancock, 2011). However, there are many studies showing how online social interactions can contribute to distress, body image concerns, envy, and lower life satisfaction (Appel, Gerlach, & Crusius, 2016). Especially with the increased social media use

by millennials (Perrin, 2015), it is important to see at what point in their lives they have used social media (childhood, adolescence, or emerging adulthood) the purposes behind this use (socialization, self-exploration or voyeurism), and the extent to which it is balanced by positive in-person social interactions. This exploration provides insight into the full impact of this new domain of interpersonal relations (Coyn, Padilla-Walker, & Howard, 2015).

Recent research grounded in the Uses and Gratifications Theory has investigated how individual differences influence selection of social media platforms and how this may influence its impact. It appears that the process of self-selection of media contributes to individuals' gratification with use (Phua, Jin, & Kim, 2017). The theory assumes that the behavior is goal-directed, satisfies personal needs such as information or communication needs, and aligns with current psychosocial functioning (Rubin, 1993). Because individuals might engage in this self-selection through the perspective of these assumptions, their selections of media might present a vehicle for autonomy and identity development (Coyn, Padilla-Walker, & Howard, 2015) in a positive or a negative way depending on the individuals' needs and psychological well-being: thus, media use is individualized and is influenced by different facets of identity and self.

To follow up with this theory, the Media Practice Model by Steele and Brown (1995) was developed to clarify how initial selection of choice of media use is dependent on personal interests and characteristics and the following interaction with media is dependent on match with interests and attention received from the platforms. For instance, people might use Facebook for informational and communication purposes and Instagram for self-presentation and entertainment goals. This leads to unique experiences and influences from these different social media platforms and experiences; thus, social media can influence both well-being and psychopathology through different mediators depending on individuals' characteristics and

personality. Considering the interpersonal aspects of BPD, it is specifically important to assess how individuals with BPD or high BPD symptomology use social media and/or how their social media experiences might influence their symptomatology and behaviors.

Despite these theories suggesting that media use is highly personalized, many researchers have sought to investigate generalized motives behind social media use. For instance, although researchers found significant differences between genders, age groups, and the big five personality traits for a sample of Turkish university students' motivations for using Instagram and Facebook, there were some common patterns: Instagram use was positively correlated with self-presentation and entertainment motives, whereas Facebook use was positively correlated with educational and informational motives (Kircaburun, Alhabash, Tosuntaş, & Griffiths, 2018). However, both platforms were also found to be positively associated with problematic social media use and these links were strongest for introverts and individuals who engaged in passive or mindless patterns of use (Kircaburun et al. 2018). Self-representation is another strong motivation behind social media use, especially because people have the flexibility to express only the aspects of themselves that they prefer to share. For instance, some individuals have been shown to hide some parts of themselves online (McKenna, Green, & Gleason, 2002) and the selves presented online are sometimes possible or ideal selves rather than depicting the real self (Manago, Graham, Greenfield, & Salimkhan, 2008). Although these studies were mostly conducted with normative, non-clinical samples, it is also important to assess the drives behind motives of use for individuals with increased interpersonal impairments and higher BPD symptomology to see whether the drives might differ from normative samples.

Experiences on social media could contribute to many experiences of interpersonal dysfunction. For instance, in non-clinical samples, it is seen that excessive use of social media

might cause fewer in-person interactions and communications (Reich et al., 2012). Thus, it might be expected that the content online should result in higher reactivity compared to interactions in real life in individuals with high social media use, as social media can be the primary source for social interactions. There is research that shows people with low self-esteem prefer using Facebook to benefit from a safe social environment and more social support compared to live social interactions they find in the outside world (Forest & Wood, 2012). Thus, people with higher interpersonal dysfunction might find online platforms more supportive, or at least seek them for the support they do not receive in real life. However, considering the negative effects of social media such as engaging in upward social comparison and envy, there is the possibility of a detrimental cycle in which people use social media to get social support, but then engage in upward social comparison and lower their self-esteem even more (Vogel, Rose, Roberts, & Eckles, 2014).

In a study on social media use and depression and anxiety symptoms, the researchers found that being "wired" (people with problematic/addictive social media use) and "connected" (people with non-problematic social media use that still reported high frequencies of use) are associated with increased symptoms of depression, which indicates some links between higher use and depression (Shensa, Sidani, Dew, Escobar-Viera, & Primack, 2018). Further analysis showed that wired individuals seek more attention and reflect it on social media by constantly updating statuses and checking feedback as in likes and comments (Shensa, Sidani, Dew, Escobar-Viera, & Primack, 2018). This relates to the idea of excessive reassurance seeking: some people are in constant need of making themselves visible to receive likes from others and feel worthy with their concept of themselves highly dependent on this feedback. Interestingly, the people in the connected group also showed similar patterns of reassurance seeking behaviors

with weaker correlations, even though they were not considered as problematic users. This suggests that although the difference in use levels between the wired and the connected groups might be statistically significant, just the act of using social media platforms frequently might alter interpersonal patterns of functioning due to the highly evaluative and feedback driven nature of this online interpersonal domain (Shensa et al., 2018).

Another issue is when people use social media passively (i.e. avoidance to post, checking the feed and other people's profiles), which may result in feelings of loneliness and low affective well-being (Verduyn et al., 2015). Through an upward comparison process, passive users feel left out while everyone is sharing their best versions of themselves. A study examining the feelings of ostracism after passive use of Facebook showed that inducing the feelings of being left out brought a decreased sense of belonging in individuals, interfering with their well-being (Schneider et al., 2017). Thus, the research suggests that social media use can induce some impairments in interpersonal functioning by inducing loneliness, lower self-esteem, and attention seeking. It is crucial to investigate different types of social media use in the context of BPD to see whether some online interactions can be especially problematic for individuals with high BPD symptomology since interpersonal impairments are focal points in BPD.

Despite having similar social comparison effects as Facebook, Instagram, in particular, may lead to different psychological concerns such as self-objectification, upward social comparison, and inaccurate self-expressions due to the high visual context it offers. Because it is photo-based and has a more visual concentration, problematic Instagram use can cause internalization symptoms due to self-objectification. Vandenbosch and Eggermont (2012) conducted a general media study to understand how people, especially young women, are influenced by body standards depicted on television, magazines, and social networking sites.

They hypothesized that sexual objectification on the various media platforms would increase internalization, self-objectification, and body surveillance. Interestingly, only online social networking sites were found to be positively associated with self-objectification and body surveillance: no direct links were found for other types of media promoting these behaviors (Vandenbosch, & Eggermont, 2012). This suggests that online relationships and interactions on Instagram may be especially potent for certain psychological dimensions such as body satisfaction and self-acceptance.

These different effects of various media types may emerge because of the autonomy that social media provides when people actively use it to represent themselves: the sexual objectification might feel more targeted and personalized because people actively engage in the use. For instance, mediator effects such as internalizing cultural beauty ideals, and upward social comparison were found in a recent study while investigating the causes of self-objectification and body surveillance (Feltman & Szymanski, 2018). The study was extended later to see whether having feminist beliefs would interfere with these associations, however, no significant influence was found. Thus, the content on Instagram feels targeted to one's own body even if the individuals know the reality that most body ideals are imposed and unrealistic. This suggests that interactions on Instagram are experienced as far more personalized and more directly target one's views about oneself. Thus, links between exposure to content about other people's lives on Instagram and one's self-concept warrants attention.

Conclusively, shifts to online platforms for communication purposes have changed our understanding of social context and interpersonal functioning. These shifts have shown to be related to psychosocial components of psychopathology. Disorders that involve high levels of problematic interpersonal relationships as symptoms, such as BPD, are especially likely to be

influenced by this newly emerged context. However, no studies have been conducted to examine the associations between interpersonal interactions on social media and BPD symptom processes yet. Especially for individuals with BPD or high BPD symptom severity, social media use might lead to higher levels of social comparison and envy. It may also lead to greater damage of interpersonal relationships because of constant exposure to the well-presented lives of others and also to a provoked need to seek reassurance from people. Similarly, because individuals with BPD do not have a strong sense of self and might base their self-worth on others' approval, Instagram can promote greater levels of social comparison (Stapleton, Luiz, & Chatwin, 2017) in those individuals. Lastly, because emerging adulthood is a very sensitive stage as the social circles of individuals change drastically, it might be especially distressing to see other people's lives presented as very well put together specifically during this life stage.

Considering these aspects of importance in BPD and social media research, the proposed study aims to investigate whether people with higher BPD symptom severity and lower self-concept clarity might be more susceptible to rejection on social media compared to people with lower BPD symptom severity and higher self-concept clarity. Additionally, we aim to see whether intensity of Internet and social media use might be an indicator of whether some people are reactive to online rejections more strongly than rejections that occur in more real-world settings.

Current Study

Although one's self-views form and possibly change over time depending on how others view them, self-concept clarity used in this study refers to a more general notion of one's feelings about their sense of self and coherence of these feelings across situations and time. It is expected that self-concept clarity will have an impact on immediate emotional reactivity right

after an exposure to negative peer-evaluative feedback. In individuals with high BPD symptoms, poorer emotion regulation and higher emotional reactivity have been observed in the face of social stressors. Thus, the proposed study aims to investigate the role of self-concept clarity on the possible negative affect and high emotional reactivity induced by negative peer evaluation in individuals with high borderline symptom severity using a nonclinical sample. It is important that a nonclinical sample is being used here because it provides information about preventative steps to take and whether self-concept clarity can be a target treatment for individuals at risk.

With the growing popularity of social media and heightened everyday exposure to peer feedback on social media, it is also crucial to examine whether some individuals might show heightened sensitivity to negative social evaluation on a social media setting compared to negative social evaluation in a more "real-world" setting. In line with these questions, it is first hypothesized that people with high self-concept clarity and lower BPD symptom severity will be less reactive to negative social evaluative feedback in either a social media context or a non-social media context. Conversely, people with higher BPD symptom severity will be more reactive to negative social feedback, and this effect may be moderated by degree of self-concept clarity. Second, individuals with higher usage of Instagram and higher severity of problematic Internet use will be more reactive to negative feedback on social media than individuals with lower/less problematic use.

To answer these questions and test the hypotheses, information on borderline symptom severity, depression, emotion regulation and social functioning of participants was collected through self-report measures. Then, a well-known paradigm to induce social evaluative rejection was used. In this task, participants were told that they were taking part in a multi-site study on likeability assessing how peers rate each other based on first impressions. With this

cover story, they were prompted to participate in a reciprocal social evaluation task in which they were shown a photo of a peer and asked to rate the peer on likeability, specifically, whether they liked the peer or not. Then, they were asked to indicate whether they thought the peer liked them back or not and were shown the supposed feedback. The supposed feedback gradually became more negative as the participants proceeded with the task so that a sense of peer rejection could be induced. One part of the task resembled everyday social interaction, the other resembled social media to investigate whether emotional reactivity would depend on the type of interaction. Psychophysiology measures were taken during this social evaluation task to measure emotional reactivity. Specifically, cardiovascular reactivity and galvanic skin response were used as they have been used previously in the literature to measure emotional reactivity to social stressors (Gendolla & Richter, 2006; Hollenstein, McNeely, Eastabrook, Mackey, & Flynn, 2012).

This work aimed to advance theoretical insights into how clarity of sense of self might contribute to factors related to interpersonal functioning such as emotion regulation skills and emotional reactivity in the face of social stressors. With a specific focus on BPD, a disorder that is highly marked by interpersonal dysfunction and impaired sense of self, the study sought to draw conclusions about at-risk individuals in non-clinical samples to understand the interplay between vulnerabilities in interpersonal functioning and psychological well-being. Lastly, it looked to gain a deeper understanding about induced affect from rejection on social media and its links to psychological well-being.

Method

Participants

Participants in the study included 36 Connecticut College students recruited through SONA as well as through recruitment posters. The sample was 79.5% female identifying, and predominantly white (64.7%). The mean age of the sample was 19.15 (*SD* = 0.93). Connecticut College students who take classes from the Psychology department participated in this study for course credit through the SONA system. Additionally, students from outside the Psychology department participated in the study and were reimbursed for their time with a $10 cash prize. The only inclusion criterion was to have an Instagram account with at least one post in it. Each participant went through the two conditions of the task in a counterbalanced order. There were no dropouts throughout the study, thus data from all 36 participants were included for final analyses.

Materials/Instruments

After Informed Consent (see Appendix A) and asking about the following demographic variables: age, gender, race, ethnicity, and class year (see Appendix L), several constructs were assessed using the measured described below.

Self-Report Questionnaires

Self-Concept Clarity. The Self-Concept Clarity Scale (SCC; Campbell et al., 1996) is a 12-item questionnaire with items rated on a Likert scale ranging from one to five that measures the clear and consistent sense of self (self-concept) across situations and contexts with a strong internal consistency (Cronbach's α = .86; see Appendix B). This measure was used to assess the extent to which self-concept is clearly defined and stable across time. In this study, the scale demonstrated acceptable internal consistency (Cronbach's α = .71).

Emotion Regulation. The Emotion Regulation Questionnaire (ERQ; Gross & John, 2003) is a two-factor 10-item scale that assesses habitual use of reappraisal and suppression as the two emotion regulation strategies with items rated on a Likert scale ranging from one (strongly disagree) to seven (strongly agree). It has a strong internal consistency and criterion-related validity (see Appendix C). This measure was included to explore emotion regulation strategies in the sample.

Emotional Reactivity. The Emotion Reactivity Scale (ERS; Nock, Wedig, Holmberg, & Hooley, 2008) is a 20-item self-report measure to assess emotion sensitivity, persistence and intensity (see Appendix D). It was included to assess whether general emotional reactivity patterns can predict the extent to which one gets reactive during the social evaluation task.

Borderline Symptoms. The Borderline Symptom List-23 (BSL-23; Bohus et al., 2009) is a 23-item measure with items rated on a scale from 0 (not at all) to 4 (very strong) with strong internal consistency (Cronbach's α = .93). It assesses the severity of borderline personality disorder symptoms and addresses related components such as emotional reactivity, perceived worthlessness, and fear of abandonment. All the self-harm and suicide items were removed (see Appendix E) as required by the IRB. This scale was used to assess how borderline symptom severity was related to the level of reactivity when faced with negative peer feedback. In this study, the scale demonstrated excellent internal consistency (Cronbach's α = .91).

Problematic Internet Use. The Internet Severity and Activities Addiction Questionnaire (ISAAQ) is a 15-item unidimensional scale assessing the presence of problematic internet use and activities on various devices. Because it is a measure that has not been published yet from Sam Chamberlain and his team (see Appendix F), psychometric properties are not yet known. Items assess frequent online presence and the extent to which one gets negatively impacted by

the amount of time spent online. In this study, it was used to assess problematic internet use severity to see how the level of severity is linked to reactivity on a social media setting. In this study, the scale demonstrated good internal consistency (Cronbach's α = .88).

Psychological Symptoms. The Brief Symptom Inventory (BSI; Wideman et al., 2013) covers nine dimensions of psychological distress (somatization, obsession-compulsion, interpersonal sensitivity, depression, anxiety, hostility, phobic anxiety, paranoid ideation and psychoticism) and their symptoms with a good internal reliability in subscales (ranging from Cronbach's α = .71 on psychoticism to Cronbach's α = .85 on depression). All self-harm and suicide items were removed as required by the IRB (see Appendix G). With a focus on three of the subscales (interpersonal sensitivity, depression and anxiety), the study aimed to find correlations between these dimensions and borderline symptom severity, and self-concept clarity. In this study, there was good internal consistency for interpersonal sensitivity (Cronbach's α = .83), acceptable internal consistency for depression (Cronbach's α = .79), and good internal consistency for anxiety (Cronbach's α = .81).

Perceived Social Support. The Multidimensional Scale of Perceived Social Support (MSPSS; Zimet, Dahlem, Zimet, & Farley, 1988) is a 12-item measure that evaluates perceived support from friends, family, and significant others (see Appendix H) and was used to assess social functioning.

Rejection Sensitivity. The Rejection Sensitivity Questionnaire (RSQ; Berenson et al., 2009) is a 9-item measure that assesses dispositional tendencies to anxiously expect and perceive social rejection (see Appendix I) and was used to assess whether rejection sensitivity tendencies were related to reactivity patterns in the social rejection laboratory task.

Social Media Use. In addition to these other measures, three questions about Instagram and social media use were asked (see Appendix N) to assess frequency and type of use.

Questionnaire Data Reduction and Analysis Strategy. To restrict the number of analyses presented in this thesis, responses for the Emotion Regulation Questionnaire, Emotional Reactivity Scale, Multidimensional Scale of Perceived Social Support and Rejection Sensitivity Questionnaire were collected but not analyzed. For statistical analyses, self-concept clarity (SCC Scale), borderline symptom severity (BSL-23), internet use severity (ISAAQ), and time spent on social media and Instagram were used to divide participants into two groups (high and low) using a median split for each measure.

Psychophysiological Recordings

Upon completion of all questionnaires, participants were set up to do the laboratory task which is further explained under the Procedure section. Psychophysiological data were collected for the duration of the laboratory task using a wristband called E4 wristband. Electrodermal activity and heart rate were recorded and analyzed as a measure of human arousal response to get an estimate of psychophysiological reactivity. Each participant had separate data files that contained data for each of the measures. Electrodermal activity, also called galvanic skin response, was collected as tonic skin conductance level (SCL) and phasic skin conductance response (SCR) in μS, sampled at four Hz. While SCL is mostly concerned with continuous shifts in the galvanic skin response, SCR refers to sudden peak responses in electrodermal activity as a quick response indicator. For this thesis, analyses focused on tonic skin conductance level because as the task was gradually getting more negative, a gradual and continuous shift in electrodermal activity was expected. Heart rate was computed in spans of 10 seconds as average heart rate values for each 10 seconds window. Data files were exported and time stamped.

Timestamps were used to identify at which points participants started and finished the baseline, neutral feedback and negative feedback conditions in the tasks. Averages of the recordings for each of the three time windows were computed and used for statistical analyses.

Procedure

Pre-Laboratory Visit

Once participants signed up either through SONA under the title "A Multi-Site Study of Likeability and Psychological Well-Being" or by reaching out to the researcher to schedule a slot from an advertisement on campus (see Appendix J), they were prompted to submit a headshot of themselves as well as an Instagram screenshot of a photo of their choosing from their personal profile. With a brief explanation, they were told that the photos were to be uploaded to an online platform in which peers rate each other on likeability (see Appendix M). In reality, emails with photos were disregarded and deleted immediately both from the inbox and from the trash folder by the researcher. This deception was needed to make the online photo rating task in the lab seemed more real. Participants were asked to rate the photos of others for likeability in the lab, and then were given feedback about how much others liked them. In reality, nobody rated their photos. The feedback was uniformly negative for all participants and negative feedback was presented more and more towards the end of the task. Having participants submit their own photos made the social evaluation component of the study credible and therefore more potentially impactful on mood and rejection sensitivity.

Laboratory Visit

Before participants got started with the lab session, there was a brief screening to see whether some participants were at higher risk of having extreme negative affect or stress after the lab session using an IRB approved protocol. Specifically, two of the scales that were administered

(Brief Symptom Inventory and Borderline Symptom List) were presented in the beginning of the study right after the consent form. After participants completed those two scales, they were asked to wait for a few minutes. Meanwhile, the researcher looked through the most recent Qualtrics response identified with the participant to see whether they scored high enough to be excluded from the following reciprocal social evaluation task. If it were the case that they should not continue with the social evaluation task, they were to be given a separate debriefing form (see Appendix O) with recommendations for mental health providers on campus and ways to contact them. The following items were reviewed and responses with scores above 4 or 5 were considered high, therefore, requiring participants to be excused from the rest of the lab-session (none were excused):

- From Borderline Symptom List (BSL), items #11, 12, 16, 15, 18, 23 (see Appendix E)
- and from the Brief Symptom Inventory (BSI), items #3 & 9 (see Appendix G)

After completing the informed consent and questionnaires, participants were set up with the psychophysiology equipment and told details about the laboratory task. The task that was being used here, commonly referred to as reciprocal social evaluation paradigm, has been shown to elicit emotional responses related to social evaluation (Gunther Moor et al., 2010; Rodman et al., 2017; Somerville et al., 2006, 2010). Random headshots and Instagram screenshots from other people were shown in a counterbalanced order. The photos presented in the task were taken from a website that provides photos of people that are created with artificial intelligence (see https://generated.photos) and from a previous administration of the task to which the researcher had access. These photos were used for both headshot photos and Instagram screenshots: “fake” Instagram profile shots were created following the general template of Instagram. Once participants saw a face, they were asked “Do you like this person?” and they were to submit

their response as a "Yes" or "No." Then, they were asked "Do you think this person likes you?" and they had the option of clicking either "Yes" or "No" before being shown the feedback on whether the person had actually "supposedly" said "Yes" or "No." The structured reciprocal social evaluation task incrementally provided more negative feedback than positive feedback to induce the perception of social rejection. There were five sets of photos and each set contained seven photos. Positive feedback began with a rate of 90% and dropped down to 20% at the end of the task, such that the last set of photos contained four negative feedback and one positive feedback photo. Participant positive and negative mood ratings were collected using the PANAS before and after the task and physiological reactivity was measured throughout the task.

Post Laboratory Task

Because the task had the potential of inducing negative affect in participants, they underwent a positive mood induction process after they finished the task, and then were fully debriefed. For the positive mood induction, participants were given a list of words that represent positive characteristics (e.g. trustworthy, loyal, kind) and asked to pick three traits that they demonstrate in their personal life. Then, they were asked to elaborate on one instance in which they demonstrated a particular quality in their personal life. A similar mood induction has been used successfully by Hooley and St. Germain (2014).

Debriefing included: (1) explanation of the deception in the study (e.g. their photos were not uploaded anywhere, the task involved planned social feedback that was not real and became increasingly negative for all participants regardless of how likeable they really are, delivery of negative feedback about likeability was necessary to understand how people respond to negative social feedback both emotionally and physiologically), (2) the opportunity for participants to have questions answered, (3) brief reminder of the study security procedures to ensure

confidentiality of study data, (4) confirmation that study participants have experienced no adverse outcomes or risks in association with the study, and (5) provision of mental health referral resources if necessary (see Appendix K).

Ethical Issues

The study used deception because participants had to believe that the laboratory task was taking place with real feedback from peers/other study participants. There was also the potential for lingering distress, especially in high risk individuals. Pre-screening, positive mood induction and a strong debriefing statement were used to address these concerns, as described above.

Results

Overview

The objective of the current study was to investigate the influence of self-concept clarity on links between borderline personality disorder symptomatology and emotional and physiological reactivity in light of a social stressor. Self-reported data on self-concept clarity (SCC), borderline personality disorder symptomatology (BSL), problematic internet use (ISAAQ), emotional reactivity (ERS), anxiety (BSI_anxiety), depression (BSI_depression), and interpersonal sensitivity (BSI_intsens) were used as main variables of interest. Physiological reactivity, specifically heart rate and electrodermal activity (EDA), and self-reported affect before and after the experimental social stressor (PANAS) were the primary outcome variables. Heart rate and EDA were each chunked in 3 time-periods: pre-task (baseline), task (first two minutes of the task), and task-negative (remaining four minutes of the task where it gradually gets more negative) for each of the two conditions of the task (headshots and Instagram photos) for the purposes of statistical analyses. First, basic descriptives of the sample on main variables of interests are presented. Second, intercorrelations between independent variables and

correlations between independent and dependent variables are presented. Later, main analyses addressing the research hypotheses are presented with some follow-up explanatory tests.

Descriptive Statistics of Main Variables of Interest

A table of descriptives (see Table 1) demonstrates the mean scores of participants on the main variables of interests as well as standard deviations, minimum, and maximum values. The mean score for Borderline Symptom List (BSL) was relatively low: 12.53 out of a possible 84 with a maximum value of 44 which shows that the sample did not have many clinically severe cases of borderline personality symptomatology. Self-concept clarity scores were relatively higher with a mean of 38.58 out of a possible 60, and problematic internet use scores (ISAAQ) had a mean of 37.89 out of a possible 90. In addition to collecting ISAAQ scores for participants, simple questions on their social media and Instagram usage were also asked and are presented in Table 2.

Table 1
Descriptive Statistics of Main Variables

Variable	Mean	Std. Dev.	Min.	Max.
BSL	12.53	10.28	0	44
SCC	38.58	7.49	24	53
ISAAQ	37.89	9.99	21	56
ERS	37.08	15.86	1	68
BSI_anxiety	4.67	4.26	0	20
BSI_depression	4.61	4.12	0	13
BSI_intsens	4.44	4.44	0	18

Note. BSL = borderline symptoms, SCC = self-concept clarity, ISAAQ = problematic internet use, ERS = emotional reactivity, BSI_anxiety, BSI_depression and BSI_intsens = anxiety, depression and interpersonal sensitivity on the BSI, respectively.

Table 2.
Social Media Use Patterns

Time spent daily	10 mins		10-30 minutes		31-60 minutes		1-2 hours		2-3 hours		4+ hours	
	n	*%*	*n*	*%*	*N*	*%*	*n*	*%*	*n*	*%*	*n*	*%*
Platform												
Instagram	5	14.7	8	23.5	10	26.5	9	23.5	3	8.8	1	2.9
Social Media	1	2.9	2	5.9	6	17.6	8	23.5	9	23.5	10	26.5

**Note.* $N = 36$.

Intercorrelations between IVs, DVs and correlations between IVs and DVs

First, intercorrelations between main variables of interest were assessed (see Table 3). Borderline symptoms were positively correlated with emotional reactivity ($r(36) = 0.36$, $p = 0.031$) and positively correlated with anxiety, depression, and interpersonal sensitivity on the BSI ($r(36) = .70$, $p < .001$; $r(36) = .82$, $p < .001$; $r(36) = .63$ $p < .001$, respectively). While self-concept clarity was not found to be correlated with any of the other independent variables, there were significant positive correlations between emotional reactivity (ERS) and problematic internet use (ISAAQ; $r(36) = .37$, $p = 0.027$) as well as emotional reactivity and anxiety, depression, interpersonal sensitivity on the BSI ($r(36) = .37$, $p = 0.025$; $r(36) = .34$, $p = 0.043$; $r(36)= .50$, $p < .0012$ respectively).

Table 3
Intercorrelations Between Main Variables

Variable	1	2	3	4	5	6	7
1. BSL	—						
2. SCC	−0.30	—					
3. ISAAQ	0.20	−0.19	—				
4. ERS	−0.36*	0.18	0.37*	—			
5. BSI_anxiety	0.70**	0.19	0.02	0.37*	—		
6. BSI_depression	0.82**	0.29	0.25	0.34*	0.68**	—	
7. BSI_intsens	0.63**	0.20	0.10	0.50**	0.75**	0.62**	—

Note. $p < 0.05$*, $p < 0.01$, $p < 0.001$****
**Note 2. BSL = borderline symptoms, SCC = self-concept clarity, ISAAQ = problematic internet use, ERS = emotional reactivity, BSI_anxiety, BSI_depression and BSI_intsens = anxiety, depression and interpersonal sensitivity on the BSI, respectively.*

Next, intercorrelations between outcome measures were examined to assess reliability of measurement and effectiveness of experimental social stressors. Heart rate during the initial phase of the headshot condition was significantly correlated to electrodermal response during that same headshot time point ($r(36) = .37$, $p = .033$) and also to heart rate during the initial phase of the Instagram condition ($r(36) = .34$, $p = .044$) suggesting reliable measurement of physiological reactivity, but also variability. Heart rate during the initial phase of the Instagram condition was correlated with both heart rate at Instagram baseline (HR_preinstagram; $r(36) = 0.35$, $p = 0.034$) and heart rate during the negative phase of this condition (HR_instagramneg; $r(36) = 0.60$, $p < .001$). Similarly, electrodermal activity during the initial phase of the headshot condition was correlated with electrodermal activity at the headshot baseline (EDA_preheadshot; $r(36) = 0.96$, $p < .001$), and electrodermal activity during the negative phase of this condition (EDA_headshotneg; $r(36) = 0.98$, $p < .001$). Electrodermal activity during the initial phase of the Instagram condition was correlated with electrodermal activity at the Instagram baseline

(EDA_preinstagram; $r(36) = 0.93$, $p < .001$), and electrodermal activity during the negative phase of this condition (EDA_instagramneg; $r(36) = 0.98$, $p < .001$), suggesting that people responded similarly to different modes of the task, and showing high stability of electrodermal activity relative to heart rate. Having the heart rate and electrodermal activity measures at different times correlated within themselves also suggested reliable measurement of physiological reactivity. Lastly, self-reported measures of affect were also examined and positive affect before the tasks was found to be strongly correlated with positive affect after the tasks ($r(36) = 0.85$, $p < .001$), and negative affect before the tasks was moderately correlated with negative affect after the tasks ($r(36) = 0.46$, $p < .001$). Positive affect after the tasks was also found to be moderately correlated with heart rate during the negative phase of the Instagram condition ($r(36) = 0.42$, $p = 0.011$), however no other significant correlations between self-reported affect were found with physiological measures.

Next, main variables of interest were examined for possible associations with the outcome measures. First, although not correlated with other independent variables, self-concept clarity (SCC) was found to be correlated with many of the timepoints in the outcome variables across condition type (headshot/Instagram) and across reactivity assessment (heart rate, electrodermal activity, self-reported emotion). Heart rate at baseline Instagram condition ($r(36) = 0.36$, $p = 0.031$), heart rate at negative phase of the Instagram condition ($r(36) = 0.31$, $p = 0.069$) were correlated with self-concept clarity. Somewhat counterintuitively, people with high self-concept clarity had slightly higher heart rates at the baseline Instagram condition and marginally higher heart rates at the negative phase of the Instagram condition. Electrodermal activity at the Instagram condition ($r(36) = -0.34$, $p = 0.041$) and electrodermal activity at the negative phrase of the Instagram condition ($r(36) = -0.37$, $p = 0.025$) were also found to be correlated with SCC

such that people with low SCC were more reactive at those conditions. Lastly, SCC was also correlated with positive affect before the tasks ($r(36) = 0.49$, $p = 0.003$), and positive affect after the tasks ($r(36) = 0.54$, $p = 0.001$) such that people with high SCC reported higher positive affect. Second, problematic internet use was found to be significantly correlated with electrodermal activity during the negative phase of the Instagram condition ($r(36) = 0.33$, $p = 0.47$) and also correlated with marginal significance during the initial phase of the Instagram condition ($r(36) = 0.30$, $p = 0.79$). Problematic internet use was not correlated with reactivity during the headshot condition. No other main variables of interest were found to be significantly correlated with any timepoints of the reactivity measurements.

Testing for Order Effect

Because participants either received the headshot condition or the Instagram condition first in a counterbalanced order, we tested for an order effect. While there was not an order effect for electrodermal activity measurements or for self-reported affect, there was a significant order effect for heart rate measurements. The interaction between time and task order was significant, Wilk's $\lambda = .810$, $F(2, 33) = 3.86$, $p = .031$, suggesting that if participants received the Instagram condition first, they had a higher heart rate in the headshot condition than participants who received headshot condition first (see Figure 1 and Figure 2). Although there is an order effect for heart rate, the study does not have sufficient power to incorporate order as a factor in subsequent analyses. Thus, to enable analyses of how central independent variables influence reactivity in the two rejection conditions over time, subsequent analyses collapse over the two orders, but test for confounds between order and any variable emerging as a significant predictor. There was also a significant multivariate effect for time, Wilk's $\lambda = .335$, $F(2, 33) = 32.71$, $p <$

.001, showing that all participants reported higher heart rate as the time progressed from the baseline stage to the negative feedback stages in both orders.

Figure 1

Heart rate measurements over time when participants receive headshots first

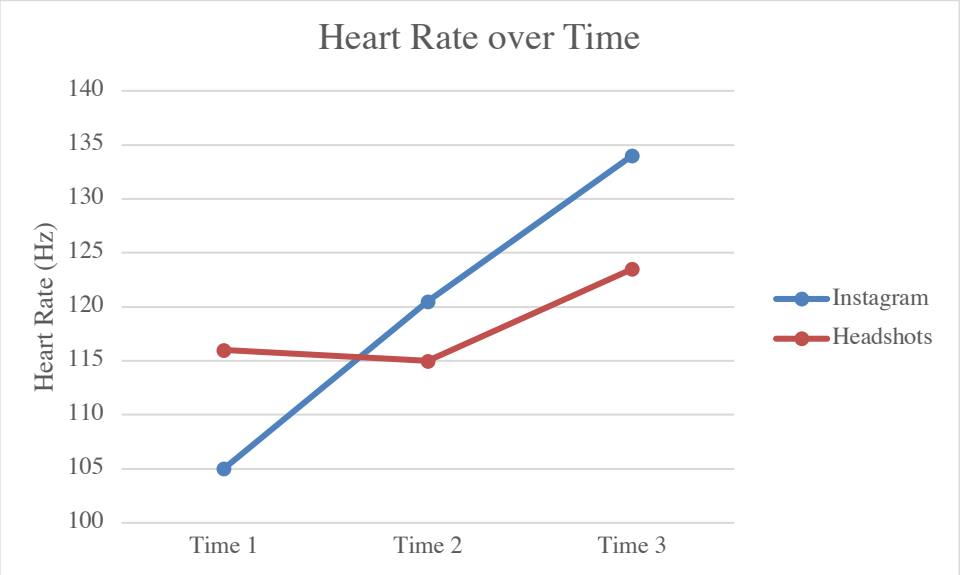
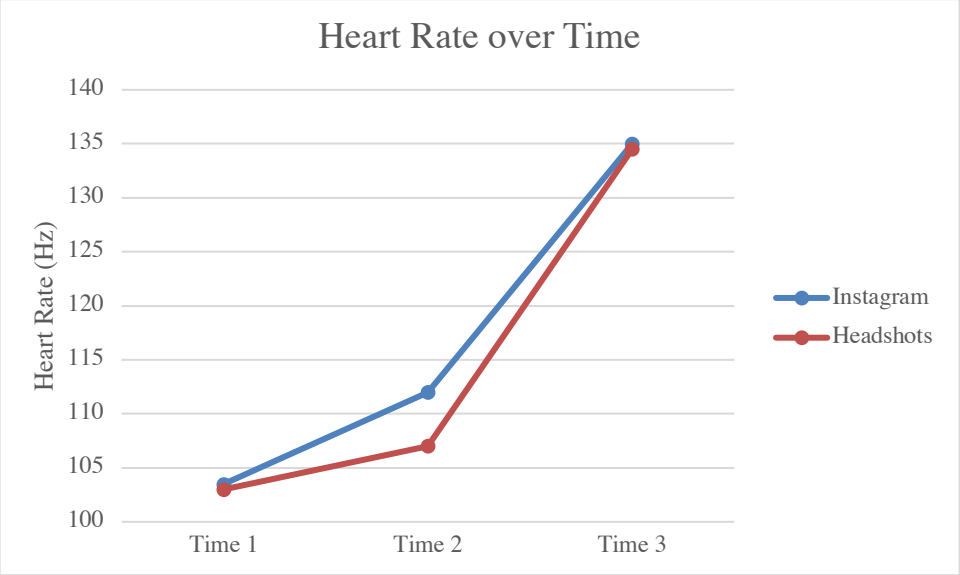


Figure 2

Heart rate measurements over time when participants receive Instagram photos first



Assessing the Influence of Borderline Symptoms and Self-Concept Clarity on Psychophysiological Reactivity During Tasks

A series of repeated measures ANOVAs was conducted to examine the relationships between two main variables of interest, Self-concept clarity and Borderline symptoms, and the outcome variables of physiological reactivity (heart rate and electrodermal activity response) and self-reported affect in social rejection conditions with different levels of resemblance to social media interactions (headshots vs. Instagram themed photos).

First, a 3 (time) x 2 (feedback mode) x 2 (borderline symptom level) x 2 (level of self-concept clarity) repeated measures ANOVA was conducted on heart rate measures to examine the interactions between borderline symptoms, SCC and heart rate activity using borderline symptoms and SCC as between-subjects variables and time and feedback mode as within-subjects variables. This model will be referred to as the full model, to distinguish it from subsequent follow-up analyses presented below. There was a significant multivariate effect in the full model for time, Wilk's $\lambda = .388$, $F(2, 31) = 24.41$, $p < .001$, $\eta 2 = .612$, indicating that participants had higher heart rates as the time progressed from the baseline stage ($M = 108.28$) through the initial feedback phase ($M = 113.20$) through the negative feedback phase ($M = 131.38$) of both tasks regardless of their borderline symptoms and SCC status. Pairwise LSD test of this main effect for time, collapsed over feedback mode, showed that heart rate at the baseline was significantly different from heart rate at the negative feedback phase ($p < .001$) and marginally different from the initial feedback phase ($p = .051$). Additionally, the initial feedback phase was significantly different from the negative feedback phase ($p < .001$). Therefore, heart rate increased slightly from baseline to initial stage of the task, and then significantly during the negative feedback phase.

There was also a significant multivariate interaction effect between time, feedback mode and Borderline symptom level in the full model, Wilk's $\lambda = .756$, $F(2, 31) = 4.99$, $p = .013$, $\eta 2 = .131$ (see Figure 3 and Figure 4). To further clarify this interaction effect, two repeated measures ANOVAs were conducted examining each feedback mode separately. First, a 3 (time) x 2 (borderline symptom level) x 2 (level of self-concept clarity) repeated measures ANOVA was conducted examining only heart rate measurements in the headshot condition. There was a significant multivariate effect for time, Wilk's $\lambda = .566$, $F(2, 31) = 11.86$, $p < .001$. Pairwise LSD tests showed that heart rate at the negative feedback phase ($M = 128.94$) was found to be higher than it was at both the baseline ($M = 110.48$, $p = .001$) and at the initial feedback phase ($M = 111.12$, $p < .001$) indicating that heart rate significantly increased only at the negative feedback phase in the headshots condition. There was a marginally significant multivariate interaction effect between time and borderline symptom level for headshots, Wilk's $\lambda = .824$, $F(2, 31) = 3.31$, $p = .050$.

Figure 3

Heart rate measurements over time in the headshots condition

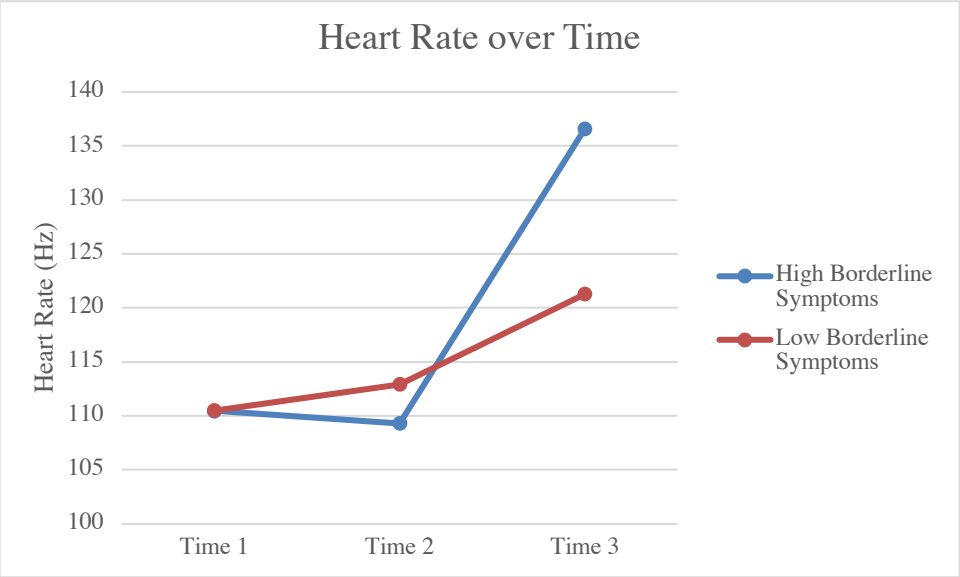
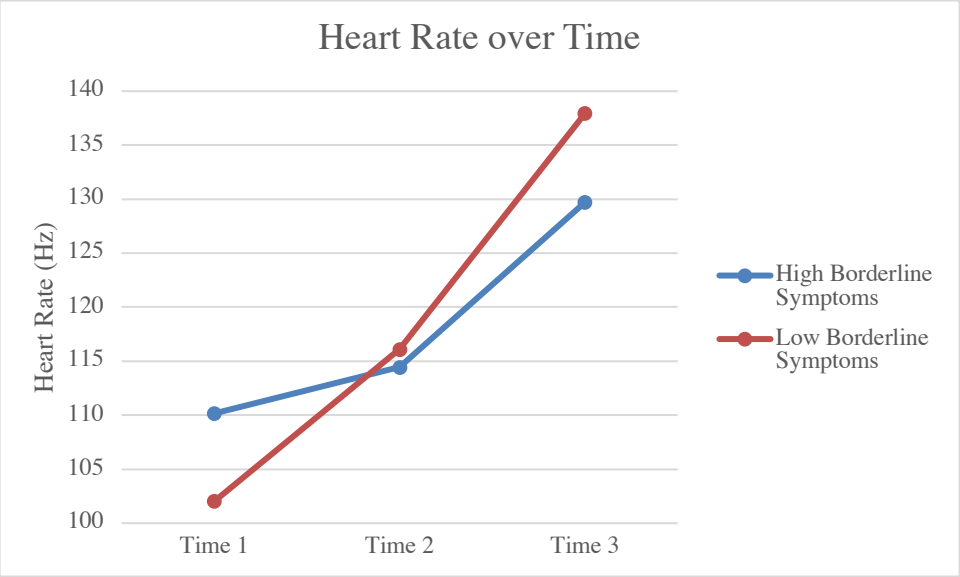


Figure 4
Heart rate measurements over time in the Instagram condition



Second, a 3 (time) x 2 (borderline symptom level) x 2 (level of self-concept clarity) repeated measures ANOVA was conducted examining only heart rate measurements in the Instagram condition. There was a significant multivariate effect for time, Wilk's $\lambda = .433$, $F(2, 31) = 20.31$, $p < .001$. Pairwise LSD tests of this main effect showed that heart rate at the negative feedback phase ($M = 133.82$) was found to be higher than it was at both the baseline ($M = 106.09$, $p = .001$) and the initial feedback phase ($M = 115.28$, $p = .043$). Additionally, heart rate at the baseline differed significantly from the initial feedback phase indicating that heart rate significantly increased at all three levels of the Instagram condition.

The multivariate interaction effect between time and borderline symptom level was not observed in the Instagram condition. However, to probe the significant multivariate interaction in the full model, two 3 (time) x 2 (level of self-concept clarity) repeated measures ANOVAs were conducted examining heart rate measurements in the headshots condition for high borderline symptom and low borderline symptom groups separately. While there were no multivariate main

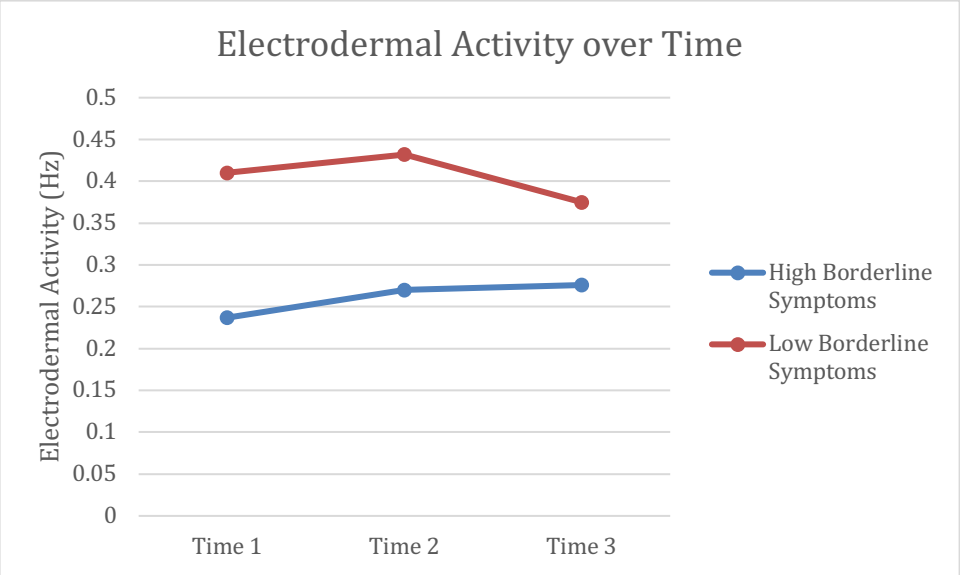
effects and no significant pairwise comparisons for the low borderline group, for high borderline individuals there was a significant multivariate effect for time for heart rate reactivity to headshots Wilk's $\lambda = .270$, $F(2, 31) = 20.26$, $p < .001$. Pairwise LSD tests showed that for high borderline individuals heart rate at the negative feedback phase ($M = 136.60$) was found to be higher than it was at both the baseline ($M = 110.46$, $p < .001$) and the initial feedback phase ($M = 109.30$, $p < .001$) indicating a significant change in heart rate measurements in the negative feedback phase of the Instagram condition for high borderline individuals only.

Lastly, in the full model, there was a between subjects effect for self-concept clarity, $F(1) = 4.73$, $p = .037$, $\eta 2 = .129$ suggesting that people with higher SCC ($M = 121.93$, $SD = 2.80$) had higher heart rates overall than did people with lower SCC ($M = 113.31$, $SD = 2.80$).

Next, the same full model repeated measures ANOVA was conducted on electrodermal activity (EDA) measures to examine the interactions between borderline symptoms, SCC and EDA using borderline symptoms and SCC as between-subjects variables and time and feedback mode as within subjects variables. There was a significant multivariate interaction effect between time and borderline symptoms, Wilk's $\lambda = .802$, $F(2, 31) = 3.83$, $p = .032$, $\eta 2 = .198$, suggesting that people with higher BSL symptoms got more reactive as the time progressed compared to people with lower BSL symptoms in both modes of the task (see Figure 5). To explore this interaction effect, two 3 (time) x 2 (feedback mode) x 2 (level of self-concept clarity) repeated measures ANOVAs were for 1) individuals with low borderline symptoms and 2) individuals with high borderline symptoms. For low borderline, there were no multivariate effect for time, and no pairwise differences in EDA over the different time points. For high borderline, the multivariate effect for time was not significant, $F(2, 15) = 2.514$, $p = .114$, but there was a significant within-subjects contrast for time, $F(1, 16) = 5.033$, $p = .039$. Pairwise LSD tests

revealed that individuals with high borderline symptoms showed a significant increase in EDA from baseline (M = .237) to the rejection phase (M = .276, p = .039), but not between the initial social feedback phase (M = .270) and the other time points.

Figure 5
Electrodermal activity measurements over time collapsed over feedback mode



Next, another full model repeated measures ANOVA was conducted on self-reported affect from PANAS to examine the interactions between borderline symptoms, SCC and EDA using borderline symptoms and SCC as between-subjects variables and time and positive/negative affect as within subjects variables. There was a significant multivariate effect for time, Wilk's λ = .700, $F(1, 32)$ = 13.69, p = .001 indicating changes in affect over time. Pairwise LSD test of the time main effect showed that affect before the tasks (M = 20.00) was significantly different from affect after the tasks (M = 18.31, p = .001). There was another significant multivariate effect for positive/negative affect condition, Wilk's λ = .317, $F(1, 32)$ = 68.97, p = .000. There was also a significant multivariate interaction effect between time and positive negative effect, Wilk's λ = .700, $F(1, 32)$ = 13.73, p = .001. In order to assess how

positive and negative affect changed over time, two paired-samples t-tests were conducted. These tests revealed that there was a significant difference in positive affect, $t(35) = 4.81$, $p < .001$ from pre ($M = 26.67$) to post ($M = 23.11$), whereas the change in negative affect was not significant.

Next, another full model repeated measures ANOVA was conducted to examine the interactions between social media usage and heart rate activity using time spent on social media as between-subjects variable and time and task mode as within subjects variables. There was a significant multivariate interaction effect between time, task mode and amount of time spent on social media per day Wilk's $\lambda = .814$, $F(2, 33) = 3.70$, $p = .034$ (see Figure 6 and Figure 7). When the same test was applied to EDA, there were no significant multivariate interaction effects observed. To further clarify this interaction effect for heart rate, two repeated measures ANOVAs were conducted examining each feedback mode separately. First, a 3 (time) x 2 (time spent on social media) repeated measures ANOVA was conducted examining only heart rate measurements in the headshot condition. There was a significant multivariate effect for time, Wilk's $\lambda = .663$, $F(2, 33) = 8.40$, $p = .001$, but no interaction effect between time and social media usage. When the same test was conducted in the Instagram condition, there was a significant multivariate effect for time, Wilk's $\lambda = .420$, $F(2, 33) = 22.79$, $p < .001$, and a significant multivariate interaction effect between time and social media usage Wilk's $\lambda = .749$, $F(2, 33) = 5.54$, $p = .008$. Pairwise LSD tests showed that heart rate at the negative feedback phase ($M = 136.60$) was found to be higher than it was at both the baseline ($M = 110.46$, $p < .001$) and the initial feedback phase ($M = 109.30$, $p < .001$), indicating a significant change in heart rate measurements in the negative feedback phase of the Instagram condition. To further explore this interaction between time and social media usage in the Instagram condition, separate

analyses were carried on for low social media group and high social media group. For individuals with lower social media usage, pairwise LSD tests showed that heart rate at the negative feedback phase (M = 140.97) was found to be higher than it was at both the baseline (M = 110.69, p = .006) and the initial feedback phase (M = 107.91, p = .002) indicating a significant change in heart rate measurements in the negative feedback phase of the Instagram condition for low social media users. For individuals with higher social media usage, pairwise LSD tests of main effects showed that heart rate measurements at the three time points were all significantly different from each other. Heart rate at the negative feedback phase (M = 132.01) was found to be higher than it was at both the baseline (M = 104.77, p < .001) and the initial feedback phase (M = 119.29, p < .001). Additionally, heart rate at the baseline differed from the initial feedback phase significantly (p = 0.007) indicating that heart rate significantly increased at all three levels of the Instagram condition for high social media users.

Figure 6

Heart rate measurements over time for low social media use group

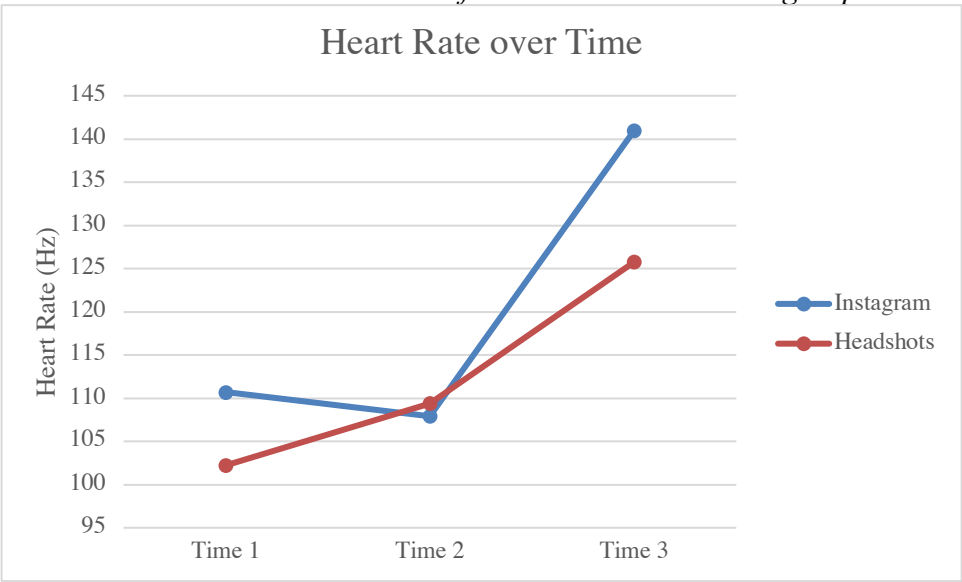
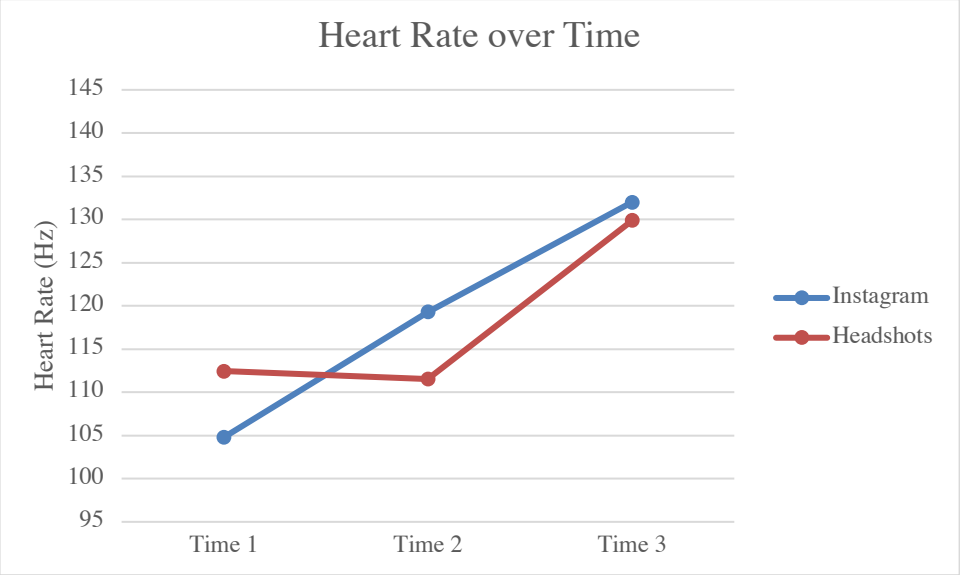


Figure 7

Heart rate measurements over time for high social media use group



Discussion

The present study sought to investigate associations between self-concept clarity, borderline personality disorder and emotional reactivity in light of a social stressor. Additionally, it aimed to explore whether the context of a social stressor, such as rejection on social media or rejection outside the context of social media, might influence the extent of emotional reactivity. First, it was hypothesized that people with higher self-concept clarity and lower BPD symptom severity would be less reactive to negative social evaluative feedback in either a social media context or a non social media context. Second, it was hypothesized that individuals with higher usage of social media, specifically Instagram, and higher problematic mobile phone use would be more reactive to negative social evaluative feedback on social media than individuals with less social media and mobile phone use.

Main variables of interest such as self-concept clarity, borderline symptomatology, depression, anxiety and interpersonal sensitivity were collected as self-report measures. Heart

rate and electrodermal activity were recorded over time during the two types of rejection tasks to measure psychophysiological reactivity, and self-reported affect was assessed before they started the tasks and after they completed both of the tasks to act as a measure of self-reported reactivity. Correlations between main variables and outcome variables supported bivariate relationships that were consistent with key hypotheses. Repeated measures analyses revealed increases in physiological reactivity in response to both forms of rejection over time. Borderline symptomatology and social media usage were shown to influence in which condition participants were more reactive, whereas self-concept clarity did not. This research suggests the importance of assessing various rejection contexts, as well as borderline symptomatology in a non-clinical sample, to develop preventative measures against emotion dysregulation in response to commonly faced social stressors.

Borderline Symptomatology and Self-Concept Clarity

There was partial support for the first hypothesis that borderline symptom severity and self-concept clarity would jointly predict reactivity to social media rejection. Borderline symptomatology did have an effect on psychophysiological reactivity of participants while going through the peer rejection task, whereas self-concept clarity did not. Measurements of electrodermal activity suggested that having higher borderline symptomatology caused more psychophysiological reactivity as the task progressed towards higher negative feedback stages. This was found to be true regardless of social rejection context type. Additionally, there was a decrease in electrodermal activity for those in the low borderline symptom group over time, but an increase in reactivity for the high borderline group. This difference in the two groups might be because the low borderline symptom group got used to the task over time and their electrodermal activity started to decrease over time, hence, their emotional arousal stabilized, and the negative

social feedback did not have an effect on their reactivity. The high symptom group on the other hand, got more reactive and emotionally aroused towards the end of the task as they received more negative peer feedback.

Measurements of heart rate suggested that in the Instagram condition, participants with high borderline symptoms did not have a significant difference from participants with low borderline symptoms in terms of either the magnitude or the trajectory of reactivity. However, in the headshots condition, participants with high borderline symptoms showed a stronger increase in heart rate response over time compared to the low borderline symptom group. The finding that individuals with higher borderline symptom severity would be reactive to social rejection is consistent with predictions. It was also predicted that these individuals would be more reactive to Instagram rejection, but in fact they were highly reactive to both rejection conditions. In contrast, individuals with low borderline symptoms were much less reactive to rejection in the headshot condition. Thus, all participants were reactive (as indicated by heart rate increases) to rejection that looked like rejection they may experience in an Instagram (social media) context, but only those with high borderline symptom severity were reactive to social rejection without social media cues. In other words, seeing headshots on the screen did not have the same power to induce reactivity in these low borderline symptom individuals. However, headshots still induced a strong reactivity in participants with higher borderline symptoms even though it might not have been very stress-inducing or believable to those with lower symptoms.

Although the same type of reactivity effects were not observed for self-concept clarity (alone or in conjunction with borderline symptom severity), heart rate measurements revealed that people with higher self-concept clarity had higher heart rates than people with low self-concept clarity throughout the social evaluation/rejection tasks. This contradicts the original

hypothesis because it was intuitively expected that people with low self-concept clarity would be more reactive to negative social evaluative feedback. This self-concept clarity finding was only for heart rate measurements and could be due to a few reasons. First, it might be the case that people with higher self-concept clarity were more alert throughout the tasks rather than upset. Heart rate measurements cannot tell us the valence of the arousal participants were feeling. Second, it might be the case that people with high self-concept clarity did not expect that much negative feedback whereas people with low self-concept clarity already expected negative feedback. So, there might have been a surprise element for people with high self-concept clarity that increased their reactivity. Another possibility is that there was unreliable measurement of self-concept clarity, a possibility that is investigated later in the discussion.

Lastly, the hypotheses about reactivity to rejection were not supported by self-reported measures of affect which served as subjective measures of reactivity. Self-reported mood change did not interact with borderline symptom severity or self-concept clarity. This is inconsistent with findings from objective measures of reactivity, psychophysiological measures, and suggests that measuring moment-by-moment objective assessments of physiological arousal is essential for detecting nuanced social rejection responses. Some people may be unwilling or unable to report such experiences through subjective self-report measures. However, subjective mood assessments did detect some broad trends in the study that objective mood assessments did not. Overall, the amount of decrease in positive affect over the rejection tasks was greater than the amount of increase in negative affect. This raises some interesting questions for emotion regulation research in the future, specifically what types of stressors might more strongly influence positive affect vs. negative affect, and what strategies might be useful for coping with these different types of affective changes to social stressors.

Effects of Social Media Use and Feedback Condition

The second hypothesis was concerned with the effects of time spent on Instagram, social media or mobile phones on reactivity to specific types of rejection. While the scores from the problematic mobile use scale (ISAAQ) did not have any effect on how reactive people got during the laboratory rejection tasks, self-reported hours spent on social media did. Individuals who reported more hours engaging in social media were more reactive and had higher heart rates throughout the entire Instagram condition, whereas individuals who reported fewer hours engaging in social media were only reactive during the negative phase of the Instagram condition. The two groups did not differ in the way they reacted to headshots conditions. This partially supports the second hypothesis because it highlights that people with higher social media use were more reactive throughout the Instagram condition, even when the feedback was not strongly negative. That they did not show the same reactivity in the condition that did not as strongly resemble social media (headshots) suggests that social media reactivity is a specific effect driven by their hours spent on social media. It makes sense that individuals who are highly engaged with social media will show more physiological engagement to a task that involves social media than individuals who are not particularly prone to make use of social media.

Reliability of Measures and Social-Evaluative Stress Induction

When interpreting these findings and evaluating the study, it is important to note that many of the self-reported measures were shown to be associated with one another with moderate to strong correlations. For instance, borderline symptomatology was correlated with anxiety, depression, interpersonal sensitivity and emotional reactivity. This suggests that measurements of these variables were in line with one another, suggesting successful reliability and accuracy of the scales. Intuitively, it was expected that self-concept clarity would be associated with at least a

few of these variables, however, no associations were found. Likewise, none of the expected interactions with self-concept clarity were found in more complex analyses with the outcome measures. This might be due to the choice of scale and the extent to which it was able to assess a cohesive sense of self. Even though Self-Concept Clarity Scale (Campbell et al., 1996) has been used in many studies and is a well-validated scale, it has not been used very widely in the borderline personality disorder literature. Although there are some clinical studies that suggest high self-concept clarity can act as a protective factor against emotion dysregulation and self-injurious urges in people with borderline personality disorder (Scala et al., 2018; Lear & Pepper, 2016), it has not been used in a non-clinical sample to study these associations between self-concept clarity and variables related to borderline personality disorder. Thus, a more detailed scale with more specific elements that would capture impairments in different facets of identity or an interview format that would give a narrative of identity development and self might have been more suitable for this study. It is also possible that low degree of borderline symptomatology in this sample may have created a floor effect for correlating with SCC.

It is also important to note that regardless of self-reported scores on borderline symptomatology and self-concept clarity, as participants progressed towards the negative feedback phase in either of the conditions of the task, their heart rates gradually increased. This suggests that the task was successful in inducing feelings of peer rejection and negative social feedback. Lastly, it is important to assess electrodermal activity's capability to assess emotional reactivity and how it was modified for analytical purposes because patterns of findings with heart rate did not show up with electrodermal activity (EDA) measure. There were some small associations between heart rate and electrodermal activity, but they were not strongly related in correlational analyses. Correlational analyses additionally showed that there was a strong

stability in EDA over time and little variability unlike the heart rate measurements. Skin conductance is a global measure of arousal or distress, but the measure is nonspecific about the cause of that stress. Thus, it is possible that it was not a sufficiently sensitive measure of a subjective internal experience like rejection-induced emotional reactivity. A second important point is that for the purposes of this study, skin conductance level, tonic level electrodermal activity which is used to reflect autonomic arousal and continuous changes, was used. However, there is another component of electrodermal activity called skin conductance response, phasic level which captures more rapidly changing responses. Perhaps, the phasic level responses would more closely track heart rate which was increasing sharply over a short time period. Future studies should examine both types of electrodermal activity for comparison.

Strengths and Limitations

While limitations exist to this study, there were also some strengths. The main strength is that the study was the first to investigate the context-dependent component of social evaluative feedback with a focus on borderline personality disorder. Considering that one of the core components of the disorder is interpersonal dysfunction, it was important to assess how the rise of social media brings new platforms to experience social evaluation, acceptance and rejection. Additionally, collecting objective measures of emotional reactivity such as heart rate and electrodermal activity allowed for more accurate conclusions. Assessing self-concept clarity was another focus of this study, and a conceptual strength, as it allowed for self-concept clarity and identity disturbance in borderline personality disorder to be examined in a non-clinical sample, allowing for inferences about possible prevention measures. Finally, all experimental sessions were administered by the same researcher on a one-to-one basis, thus, there was a high consistency in how the tasks were administered for each individual.

In addition to these strengths, the study had some limitations that could be improved in further research. Firstly, having a small sample size created problems in terms of power. Even though it was a repeated-measures design and involved within-subjects measures, because of small sample size some planned statistical analyses could not be conducted. In order to avoid between-subject confounds such as different amounts of social media use, different levels of borderline symptomatology etc., all participants received both modes of the rejection task in a counterbalanced order. With a bigger sample size, it might have been useful to use only one mode of the task on each participant rather than have them go through the same task twice with different photo stimuli (Instagram vs. headshot). Going through the same task twice might have caused fatigue or more questions around the trustworthiness of the task since both modes of the task get incrementally negative. Order analyses revealed that headshot social rejection was significantly more upsetting for participants who had been primed by Instagram rejection. When headshot rejection was experienced first, it did not induce strong reactivity. Either being able to examine order as a potentially interacting factor (larger sample size needed) or eliminating order effects by making social rejection type a between-subjects variable would have been preferable. Because order effects were not examined in the main model in order to reduce the number of analyses and focus on effects that were significant in multivariate analyses, the possibility of Type 1 error is still present and Bonferroni correction could have been used to further reduce this risk.

The sample did not have enough heterogeneity either, as most of the participants were recruited from Connecticut College's Psychology Department and were most identified as female. Another important limitation was one of the central measures, self-concept clarity. Unexpectedly, self-concept clarity was not associated with any of the other variables such as

BPD, emotional reactivity, depression and anxiety and it did not show anticipated associations to psychophysiological measures. Therefore, there might have been some limitations to the extent to which the scale was able to capture the degree of disturbance in sense of self. Additionally, since this was not a clinical sample, the overall mean score for self-concept clarity was on the higher end and this resulted in a restricted range of scores for analyses. With a bigger sample size and a non-college community sample, the scale might work better. Another limitation was that no deception check was done. It would have been useful to ask participants whether they believed in the cover story and the reality of the task to ensure that the task was successfully inducing the perception of negative feedback from a real peer. Likewise, another measure for how peer-rejected or negative individuals felt about themselves by the end of the tasks might have been useful in understanding the levels of induced perceived peer rejection rather than relying solely on change in self-reported affect. Lastly, using headshots as a substitute for a real-world setting might have not been the best way to establish a real-world scenario. This is why, in the analyses of the headshots condition was most frequently referred to as a "non social media" setting. Although this was the initial intention, it is best to think of the headshots condition as simply a non social media context or a contrast to the Instagram social rejection condition. Lastly, in order to ensure that increased physiological reactivity was not only due to engaging in a task that requires effort and concentration, participants completed a practice round for around five minutes. During that practice round, baseline information was collected, and participants had already spent five minutes concentrating and giving effort before they started the real task to control for this design threat. However, it is still possible that psychophysiological measurements were affected because the task required effort and concentration.

Future Directions

Given the shifts in our communication preferences and new mediums in which people face social evaluation every day, research on how these new mediums are related to interpersonal functioning or dysfunction requires attention. Examining this with a focus on borderline personality disorder, a disorder that is highly marked by interpersonal dysfunction, is a clinical need. Thus, studies with a focus on social media-based rejection should be conducted with clinical samples. Second, conducting similar studies with various social-evaluative threat paradigms would be useful in assessing where there is variability and where there is consistency in rejection reactions. Specifically, it would be useful to come up with tasks (e.g., live, text, email) that will truly make a real-world vs. social media comparison. Assessing other aspects of self and identity might be useful and would remove the burden of relying solely on one measure like self-concept clarity. However, more appropriate measures of self-concept clarity specifically for non-clinical samples are needed as well. It is possible that variability in self-concept clarity in normative populations can be better assessed through narrative analysis. Lastly, with a larger and more diverse sample of participants it might be possible to get stronger and more generalizable conclusions from this research.

Conclusion

Overall this study shows that 1) people with high borderline personality disorder symptomatology show heightened reactivity to negative social evaluative feedback, 2) people with high borderline personality disorder symptomatology show heightened reactivity even though the feedback did not induce any reactivity for low symptom group 3) people with higher social media usage get more reactive to social media based rejection than others do. Thus, this study advances knowledge on interpersonal functioning in different settings in the context of

borderline personality disorder and suggests that social media based rejection is a promising area of inquiry.

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Appendix A

Informed Consent

Consent to be Part of a Research Study

Title of the Project: A Study of Likeability and Psychological Well-Being
Principal Investigator: Zelal Kilic, Undergraduate Student, Connecticut College
Faculty Advisor: Audrey Zakriski, PhD., Connecticut College
Study Sponsor: Department of Psychology at Connecticut College

Invitation to be Part of a Research Study

You are invited to participate in a research study. In order to participate, you must have an Instagram account that you actively use. Taking part in this research project is voluntary.

Important Information about the Research Study

Things you should know:

- The purpose of the study is to investigate links between psychological well-being and likeability. If you choose to participate, you will be asked to complete a series of questionnaires about yourself (self-concept, mental health and well-being) and participate on an online platform where your peers and you rate each other on likeability. This will take approximately 45 mins-1 hour. During this task, your psychophysiological measures will also be collected.
- While the direct benefits of this research to society are not known, you may learn more about the relationship between social relationships and well-being.
- Taking part in this research project is voluntary. You don't have to participate, and you can stop at any time.
- Some sample statements/questions that we will ask you to rate/answer include:
    - My mood rapidly cycled in terms of anxiety, anger, and depression
    - How often do you check your email or social media account or equivalent before something else that you need to do?
    - It is often hard for me to make up my mind about things because I don't really know what I want.

Please take time to read this entire form and ask questions before deciding whether to take part in this research project.

What will happen if you take part in this study?

This study is not meant to gather information about specific individuals and your responses will be combined with other participants' data for the purpose of statistical analyses.

What risks might result from being in this study?

It is possible that some aspects of this study (rating other people, and having others rate you) could be uncomfortable or distressing: it is typical that some people find some discomfort. We do not expect these feelings to persist beyond the time you are participating in the laboratory study. If you do remain distressed, you will have a chance to talk through those feelings and receive mental health support resources. There are no known risks or discomforts related to participating in this research beyond those encountered in everyday life.

How will we protect your information?

We plan to publish the results of this study. To protect your privacy, we will not include any information that could directly identify you. Your name and any other information that can directly identify you will be stored separately from the data collected as part of the project. The photos you submitted will be deleted from both the inbox and the trashcan of the researcher's email account and right after you complete your lab session.

What will happen to the information we collect about you after the study is over?

We will keep your research data to use for future statistical analyses from the questionnaires and psychophysiological measurements. They will be stored on the desktop computer in the laboratory and will eventually be destructed after 5 years. This timeframe is usually the recommended timeframe for storage of data. name and other information that can directly identify you will be kept secure and stored separately from the research data collected as part of the project. We will not share your research data with other investigators.

How will we compensate you for being part of the study?

You will either receive course credit through SONA or compensation for your time (10$ per hour) for your participation in this study. If you decide to withdraw before 30 minutes into the study, you will receive SONA credit of 30 minutes or no compensation.

What are the costs to you to be part of the study?

There are no costs to you for participating in this study.

Your Participation in this Study is Voluntary

It is totally up to you to decide to be in this research study. Participating in this study is voluntary. Even if you decide to be part of the study now, you may change your mind and stop at any time. You do not have to answer any questions you do not want to answer. If you decide to withdraw before this study is completed, your data will not be collected or analyzed.

Contact Information for the Study Team and Questions about the Research

If you have questions about this research, you may contact **Zelal Kilic at zkilic@conncoll.edu or +8607729323 or Prof. Audrey Zakriski at alzak@conncoll.edu.**

Contact Information for Questions about Your Rights as a Research Participant

If you have questions about your rights as a research participant, or wish to obtain information, ask questions, or discuss any concerns about this study with someone other than the researcher(s), please contact the following:

Kira Phillips, IRB Administrator
Jason Nier, IRB Chairperson
Connecticut College Institutional Review Board

270 Mohegan Avenue New London, Ct 06320 Phone: (860) 439-2330 Email: irb@conncoll.edu

Your Consent

By signing this document, you are agreeing to be in this study. Make sure you understand what the study is about before you sign. I will give you a copy of this document for your records. I will keep a copy with the study records. If you have any questions about the study after you sign this document, you can contact the study team using the information provided above.

I understand what the study is about and my questions so far have been answered. I agree to take part in this study. I also agree that my psychophysiological data to be collected.

_____

Printed Subject Name

_____

Signature Date

Appendix B

Self-Concept Clarity Scale

1. My beliefs about myself often conflict with one another.*

2. On one day I might have one opinion of myself and on another day I might have a different opinion.*

3. I spend a lot of time wondering about what kind of person I really am.*

4. Sometimes I feel that I am not really the person that I appear to be.*

5. When I think about the kind of person I have been in the past, I'm not sure what I was really like.*

6. I seldom experience conflict between the different aspects of my personality.

7. Sometimes I think I know other people better than I know myself. *

8. My beliefs about myself seem to change very frequently.*

9. If I were asked to describe my personality, my description might end up being different from one day to another day.*

10. Even if I wanted to, I don't think I could tell someone what I'm really like.*

11. In general, I have a clear sense of who I am and what I am.

12. It is often hard for me to make up my mind about things because I don't really know what I want.*

Scale ranges from 1 *(strongly disagree)* to 5 *(strongly agree).*

* Indicates reverse-keyed item.

Appendix C

Emotion Regulation Questionnaire

Instructions and Items:

We would like to ask you some questions about your emotional life, in particular, how you control (that is, regulate and manage) your emotions. The questions below involve two distinct aspects of your emotional life. One is your emotional experience, or what you feel like inside. The other is your emotional expression, or how you show your emotions in the way you talk, gesture, or behave. Although some of the following questions may seem similar to one another, they differ in important ways. For each item, please answer using the following scale: 1 2 3 4 5 6 7 strongly disagree neutral strongly agree

1	2	3	4	5	6	7
Strongly Disagree			Neutral			Strongly Agree

1. When I want to feel more positive emotion (such as joy or amusement), I change what I'm thinking about.

2. I keep my emotions to myself.

3. When I want to feel less negative emotion (such as sadness or anger), I change what I'm thinking about.

4. When I am feeling positive emotions, I am careful not to express them.

5. When I'm faced with a stressful situation, I make myself think about it in a way that helps me stay calm.

6. I control my emotions by not expressing them.

7. When I want to feel more positive emotion, I change the way I'm thinking about the situation.

8. I control my emotions by changing the way I think about the situation I'm in.

9. When I am feeling negative emotions, I make sure not to express them.

10. When I want to feel less negative emotion, I change the way I'm thinking about the situation.

Appendix D

Emotion Reactivity Scale

Directions: This questionnaire asks different questions about how you experience emotions on a regular basis. When you are asked about being 'emotional,' this may refer to being angry, sad, excited, or some other emotion. Please rate the following statements.

For each statement, the choices are the following:

0 = Not at all like me, 1, 2, 3, 4 = Completely like me

1) I tend to get very emotional very easily.

2) Even the littlest things make me emotional.

3) When I experience emotions, I feel them very strongly/intensely.

4) When something happens that upsets me, it's all I can think about for a long time.

5) I experience emotions very strongly.

6) My moods are very strong and powerful.

7) My emotions go from neutral to extreme in an instant.

8) When I feel emotional, it's hard for me to imagine feeling any other way.

9) I often get so upset it's hard for me to think straight.

10) My feelings get hurt easily.

11) When I'm emotionally upset my whole body gets physically upset as well.

12) When I am angry/upset, it takes me much longer than most people to calm down.

13) People tell me that my emotions are often too intense for the situation.

14) I often feel extremely anxious.

15) I am often bothered by things that other people don't react to.

16) I am easily agitated.

17) I am a very sensitive person.

18) Other people tell me I'm overreacting.

19) When something bad happens, my mood changes very quickly. People tell me I have a very short fuse.

20) If I have a disagreement with someone, it takes me a long time for me to get over it.

21) I get angry at people very easily.

Appendix E

Borderline Symptom List

1. It was hard for me to concentrate
2. I felt helpless
3. I was absent-minded and unable to remember what I was actually doing
4. I felt disgust
5. I thought of hurting myself (to be omitted)
6. I didn't trust other people
7. I didn't believe in my right to live (to be omitted)
8. I was lonely
9. I experienced stressful inner tension
10. I had images that I was very much afraid of
11. I hated myself
12. I wanted to punish myself
13. I suffered from shame
14. My mood rapidly cycled in terms of anxiety, anger, and depression
15. I suffered from voices and noises from inside or outside my head
16. Criticism had a devastating effect on me
17. I felt vulnerable
18. The idea of death had a certain fascination for me
19. Everything seemed senseless to me
20. I was afraid of losing control
21. I felt disgusted by myself

22. I felt as if I was far away from myself
23. I felt worthless

- The BSL is composed of 23 Items that are rated by using a 5–step Likert scale (0=not at all, 4=very strong).
- A visual analog scale is used to assess global well-being.
- The extent of the actual dysfunctional behaviour can be assessed with the BSL additional scale.
- If more than 10% of the Items are missing, the scale should not be evaluated.
- The value of the global scale is calculated by adding the values of the items. To enable the comparability with the Long-Version of the BSL, it is reasonable to use the mean (sum of values of the items / number of valid items).

Appendix F

Internet Severity and Activities Addiction Questionnaire

The scale ranges from 0 = Not at all to 5 = All the time.

1. How often do you find yourself losing track of time while engaging on an internet related activity?
2. How often do you use internet related activities to block out disturbing thoughts about your life and to soothe yourself?
3. How often do you choose to spend time on internet related activities to battle loneliness or boredom?
4. How often do you neglect your normal day-to-day activities to spend more time on an internet related activity?
5. How often do you find yourself choosing to spend time in an online activity over intimacy with your partner?
6. How often do you suffer from negative financial consequences because of an online activity?
7. How often do your school/study suffers because of the amount of time you spend on internet related activities?
8. How often do you check your email or social media account or equivalent before something else that you need to do?
9. How often do others in your life complain to you about the amount of time
10. you spend online on your computer, tablet, mobile or similar device?
11. How often do you become defensive or secretive about your on-line activities?

12. How often do you find yourself trying to arrest an excessive or repetitive online activity but feeling a compulsion to continue?
13. How often do you feel preoccupied with the Internet when off-line, or fantasize or get repetitive urges to get on-line?
14. How often do you lose sleep due to late-night internet related activities?
15. How often do you find yourself experiencing physical or psychological problems as a consequence of prolonged internet related activities?
16. How often do you try to cut down the amount of time you spend on-line and fail?

Appendix G

Brief Symptom Inventory

Here I have a list of problems people sometimes have. I want you to tell me HOW MUCH THAT PROBLEM HAS DISTRESSED OR BOTHERED YOU DURING THE PAST 7 DAYS INCLUDING TODAY on a scale from: 0 = Not at all, 1 = A little bit, 2 = Moderately, 3 = Quite a bit, 4 = Extremely, R = Refused

1. Nervousness or shakiness inside

2. Faintness or dizziness

3. The idea that someone else can control your thoughts

4. Feeling others are to blame for most of your thoughts

5. Trouble remembering things

6. Feeling easily annoyed or irritated

7. Pains in the heart or chest

8. Feeling afraid in open spaces

9. Thoughts of ending your life

10. Feeling that most people cannot be trusted

11. Poor appetite

12. Suddenly scared for no reason

13. Temper outbursts that you could not control

14. Feeling lonely even when you are with people

15. Feeling blocked in getting things done

16. Feeling lonely

17. Feeling blue

18. Feeling no interest in things

19. Feeling fearful

20. Your feelings being easily hurt

21. Feeling that people are unfriendly or dislike you

22. Feeling inferior to others

23. Nausea or upset stomach

24. Feeling that you are watched or talked about by others 25. Trouble falling asleep

26. Having to check and double check what you do

27. Difficulty making decisions

28. Feeling afraid to travel on buses, subways, or trains

29. Trouble getting your breath

30. Hot or cold spells

31. Having to avoid certain things, places, or activities because they frighten you

32. Your mind going blank

33. Numbness or tingling in parts of your body

34. The idea that you should be punished for your sins

35. Feeling hopeless about the future

36. Trouble concentrating

37. Feeling weak in parts of your body

38. Feeling tense or keyed up

39. Thoughts of death or dying (to be omitted)

40. Having urges to beat, injure, or harm someone (to be omitted)

41. Having urges to break or smash things

42. Feeling very self-conscious with others

43. Feeling uneasy in crowds

44. Never feeling close to another person

45. Spells of terror or panic

46. Getting into frequent arguments

47. Feeling nervous when you are left alone

48. Others not giving you proper credit for your achievements

49. Feeling so restless you couldn't sit still

50. Feelings of worthlessness

51. Feeling that people will take advantage of you if you let them

52. Feeling of guilt

53. The idea that something is wrong with your mind

Appendix H

Multidimensional Scale of Perceived Social Support

Instructions: We are interested in how you feel about the following statements. Read each statement carefully. Indicate how you feel about each statement. Scale ranges from 1 = Very Strongly Disagree to 7 = Very Strongly Agree

1. There is a special person who is around when I am in need.
2. There is a special person with whom I can share my joys and sorrows.
3. My family really tries to help me.
4. I get the emotional help and support I need from my family.
5. I have a special person who is a real source of comfort to me.
6. My friends really try to help me.
7. I can count on my friends when things go wrong.
8. I can talk about my problems with my family.
9. I have friends with whom I can share my joys and sorrows.
10. There is a special person in my life who cares about my feelings.
11. My family is willing to help me make decisions.
12. I can talk about my problems with my friends.

Appendix I

Rejection Sensitivity Questionnaire

The items below describe situations in which people sometimes ask things of others. For each item, imagine that you are in the situation, and then answer the questions that follow it. Scale ranges from 1-6.

1. You ask your parents or another family member for a loan to help you through a difficult financial time.

- How concerned or anxious would you be over whether or not your family would want to help you?
- I would expect that they would agree to help as much as they can.

2. You approach a close friend to talk after doing or saying something that seriously upset him/her.

- How concerned or anxious would you be over whether or not your friend would want to talk with you?
- I would expect that they would want to talk with me to try to work.

3. You bring up the issue of sexual protection with your significant other and tell him/her how important you think it is.

- How concerned or anxious would you be over his/her reaction?
- I would expect that they would be willing to discuss our possible options without getting defensive.

4. You ask your supervisor for help with a problem you have been having at work.

- How concerned or anxious would you be over whether or not the person would want to help you?

- I would expect that they would want to try to help me out.

5. After a bitter argument, you call or approach your significant other because you want to make up.

- How concerned or anxious would you be over whether significant other would want to make up with you?
- I would expect that they would be at least as eager to make up as I would be.

6. You ask your parents or other family members to come to an occasion important to you.

- How concerned or anxious would you be over whether or not they would want to come?
- I would expect that they would want to come.

7. At a party, you notice someone on the other side of the room that you'd like to get to know, and you approach him or her to try to start a conversation.

- How concerned or anxious would you be over whether or not the person would want to talk with you?
- I would expect that they would want to talk with me.

8. Lately you've been noticing some distance between yourself and your significant other, and you ask him/her if there is something wrong.

- How concerned or anxious would you be over whether or not he/she still loves you and wants to be with you?
- I would expect that they will show sincere love and commitment to our relationship no matter what else may be going on.

9. You call a friend when there is something on your mind that you feel you really need to talk about.

- How concerned or anxious would you be over whether or not your friend would want to listen?
- I would expect that they would listen and support me.

Appendix J

Recruitment Poster

Appendix K

Debriefing Statement

First of all, thank you for participating in this research dealing with self-concept clarity, interpersonal functioning and emotion regulation. In this research, I am investigating the effects of self-concept clarity on emotional reactivity in light of a social stressor. In order to create a social stressor, I had to make you think that people were rating your photos. But, in reality, the study involved mild deception such that the photos you submitted to our research team were not used in any context. As soon as I received the email with your photos, I immediately deleted them from my inbox and then from my trash folder. Nobody really rated your photographs, instead you were provided with the same feedback everyone received about their own likeability, which became more negative as the task progressed. This photo rating/feedback task was measuring how people react to negative social feedback across contexts and all the photos you were shown were photos of hypothetical individuals, not real people. There are many studies in the literature about how distinct aspects of self might influence interpersonal functioning, and specifically responses to negative peer feedback. My study seeks to extend this work and further analyze the impact of context on social reactivity. Specifically, I will analyze whether some people might be more susceptible to higher emotional reactivity when faced with a social stressor resembling an online setting (Instagram photos) rather than a "real-world" setting (headshot photos). I expect to find that people with higher self-concept clarity will be less reactive to negative social feedback, and that higher problematic mobile phone use might make people more reactive to negative social feedback in an Instagram context. Mental health symptoms were measured because some are related to self-concept clarity, and because they may also help explain how strongly people respond to social stressors.

At the end of the study, I had you participate in a task that has been shown to induce positive mood in other research. I did this in case any participant experienced negative mood after completing the social evaluation task. I hope this helped balance out any negative mood you may have been experiencing. If you experience any lingering negative mood related to this study, please remember that the social feedback you received was not real. If you would like to talk with someone about negative feelings that may have come up for you during this study, please feel free to contact Student Counseling Services at 860-439-4587 or scs@conncoll.edu to set up an appointment for free counseling. If you need more immediate assistance, please consider one of the following resources:

- Mental health/suicide hotline number (National Suicide Prevention Lifeline): 800-273-8255
- Student Counseling Services after hours number: 860-439-4587

If you are interested in learning more about this area of research, below are a few articles that you may find interesting:

Matsushima, R., & Shiomi, K. (2003). Social Self-Efficacy and Interpersonal Stress in Adolescence. *Social Behavior and Personality: An International Journal*, *31*(4), 323–332. https://doi.org/10.2224/sbp.2003.31.4.323

Gross, J. J., & John, O. P. (2003). Individual differences in two emotion regulation processes: Implications for affect, relationships, and well-being. *Journal of Personality and Social Psychology*, *85*(2), 348–362. https://doi.org/10.1037/0022-3514.85.2.348

Hollenstein, T., McNeely, A., Eastabrook, J., Mackey, A., & Flynn, J. (2012). Sympathetic and parasympathetic responses to social stress across adolescence. *Developmental Psychobiology*, *54*(2), 207–214. https://doi.org/10.1002/dev.20582

If you would like to learn more about some outcomes of excessive social media use, you can find the following articles that will remind you how social media use should be informed and responsible:

Lup K, Trub L, Rosenthal L (2015) Instagram #Instasad?: exploring associations among Instagram use, depressive symptoms, negative social comparison, and strangers followed. Cyberpsychol Behav 18(5):247-252. doi:10.1089/cyber.2014.0560

Eline Frison, & Steven Eggermont (2017). Browsing, posting, and liking on Instagram: the reciprocal relationships between different types of Instagram use and adolescents' depressed mood. Cyberpsychology, Behavior, and Social Networking. doi:10.1089/cyber.2017.0156

Kevin B. Wright, Jenny Rosenberg, Nicole Egbert, Nicole A. Ploeger, Daniel R. Bernard & Shawn King (2013) Communication Competence, Social Support, and Depression Among College Students: A Model of Facebook and Face-to-Face Support Network Influence, Journal of Health Communication, 18:1, 41-57, DOI: 10.1080/10810730.2012.688250

If you have any questions or concerns about the manner in which this study was conducted, please contact the IRB Chairperson Jason Nier, janie@conncoll.edu.

You may also contact me, Zelal Kilic, at zkilic@conncoll.edu for additional resources or my adviser, Professor Audrey Zakriski at alzak@conncoll.edu, office Bill Hall 302.

Appendix L

Demographics

Please complete the following demographic information.

1. Please indicate your gender?

   Male Female Other (specify) _____

2. How old are you? (years) _____

3. What is your class year?

   2020 2021 2022 2023

4. What is your race / ethnicity

   Asian African American Caucasian Hispanic/Latinx

   Native American Pacific Islander Prefer not to answer

   Other (please specify)_____

Appendix M

Initial Email

Dear Participant,

Thank you for agreeing to participate in our study on likeability and mental health!

The experiment should take about 45-60 minutes to complete and will consist of completion of some questionnaires as well as participating in an online rating platform. In order to participate in this platform and in the study, please submit a headshot of yourself as well as an Instagram screenshot of a photo of your choosing from your profile by replying back to this email. Please note that we cannot schedule a slot for you unless you submit your photos first.

By replying to this email with your photos, you agree to give consent for us to use your headshot photograph and Instagram profile screenshot in our study and agree to take part in the study. A more detailed consent form will be provided in the laboratory session.

Study Type: In-Lab

Location: Bill Hall [Room number TBD]

Duration: 45-60 minutes.

Eligibility: Having an Instagram account with at least one post in it.

Please note that you will either receive class credit if you signed up through SONA or $10 of compensation for your time.

Do not hesitate to reply back to this email with any further questions.

Thank you very much,

Zelal Kilic

Appendix N

Questions about Social Media Use

1. How much time do you typically spend on Instagram daily?

a) 10 minutes or less

b) 11-30 minutes

c) 31-60 minutes

d) 1-2 hours

e) 2-3 hours

f) 4+ hours

2. Which other social media platforms do you use?

a) Facebook

b) Twitter

c) Youtube

d) Snapchat

e) Other (please specify): _____

3.How much time do you typically spend on social media per day?

a) 10 minutes or less

b) 11-30 minutes

c) 31-60 minutes

d) 1-2 hours

e) 2-3 hours

f) 4+ hours

Appendix O

Debriefing for Screen-Outs

First of all, thank you for participating in this research dealing with self-concept clarity, interpersonal functioning and emotion regulation. Some participants move on to the rest of the lab session while others do not, depending on the screening surveys you just completed. At this moment, unfortunately, you do not qualify to participate further in this study.

The study involved mild deception such that the photos you submitted to our research team were not used in any context. As soon as I received the email with your photos, I immediately deleted them from my inbox and then from my trash folder. For participants who continue with the later stages of the task, they were supposedly going to be used for a reciprocal social evaluation task in order to induce responses to negative peer feedback. I aim to analyze whether some people might be more susceptible to higher emotional reactivity when faced with a social stressor resembling an online setting (Instagram photos) rather than a "real-world" setting (headshot photos). I expect to find that people with higher self-concept clarity will be less reactive to negative social feedback, and that higher problematic mobile phone use might make people more reactive to negative social feedback in an Instagram context. Mental health symptoms were measured because some are related to self-concept clarity, and because they may also help explain how strongly people respond to social stressors.

If you would like to talk with someone about negative feelings that may have come up for you during this study, please feel free to contact Student Counseling Services at 860-439-4587 or scs@conncoll.edu to set up an appointment for free counseling. If you need more immediate assistance, please consider one of the following resources:

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If you are interested in learning more about this area of research, below are a few articles that you may find interesting:

Matsushima, R., & Shiomi, K. (2003). Social Self-Efficacy and Interpersonal Stress in Adolescence. *Social Behavior and Personality: An International Journal*, *31*(4), 323–332. https://doi.org/10.2224/sbp.2003.31.4.323

Gross, J. J., & John, O. P. (2003). Individual differences in two emotion regulation processes: Implications for affect, relationships, and well-being. *Journal of Personality and Social Psychology*, *85*(2), 348–362. https://doi.org/10.1037/0022-3514.85.2.348

Hollenstein, T., McNeely, A., Eastabrook, J., Mackey, A., & Flynn, J. (2012). Sympathetic and parasympathetic responses to social stress across adolescence. *Developmental Psychobiology*, *54*(2), 207–214. https://doi.org/10.1002/dev.20582

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Eline Frison, & Steven Eggermont (2017). Browsing, posting, and liking on Instagram: the reciprocal relationships between different types of Instagram use and adolescents' depressed mood. Cyberpsychology, Behavior, and Social Networking. doi:10.1089/cyber.2017.0156

Kevin B. Wright, Jenny Rosenberg, Nicole Egbert, Nicole A. Ploeger, Daniel R. Bernard & Shawn King (2013) Communication Competence, Social Support, and Depression Among College Students: A Model of Facebook and Face-to-Face Support Network Influence, Journal of Health Communication, 18:1, 41-57, DOI: 10.1080/10810730.2012.688250

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You may also contact me, Zelal Kilic, at zkilic@conncoll.edu for additional resources or my adviser, Professor Audrey Zakriski at alzak@conncoll.edu, office Bill Hall 302.