

INDIVIDUAL DIFFERENCES IN EMOTIONAL REACTIONS TO SOCIAL MEDIA

POSTS: THE ROLE OF ANGER

By

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ABSTRACT

Social media has created new ways to promote negative content that can be passed around, leaving users with undesired negative emotional states and in some cases, affecting real-life behavior. Everyone can react differently to the same content but how they ultimately react is not fully understood. The present study examined relationships between state anger (evoked by negative social media posts) anger expression styles (as indexed by the STAXI-2), and the Behavioral Inhibition System and the Behavioral Activation System (BIS/BAS). Specifically, expression styles and the BIS/BAS were examined to determine whether they can predict anger reactivity to social media posts. 304 undergraduate students viewed 30 social media posts that were previously rated as anger-inducing and asked to rate each one on how angry it made them feel. To confirm if the social media posts used in the present study resulted in an increase of anger states, state anger (as indexed by the STAXI-2) was assessed prior to and after viewing inflammatory posts. Results showed that state anger significantly increased after viewing the posts, confirming that they were successful in promoting the angry reactions. When examining the bivariate correlations between the social media anger ratings and the BIS/BAS it was found that the BIS, BAS Drive, and BAS Fun Seeking positively correlated with the anger ratings. When examining BIS/BAS & STAXI-2 scales as predictors in a multiple regression, it was found that only the BIS positively predicted anger ratings. However, an independent samples *t*-test revealed that females significantly experienced more anger than men. The findings suggest that while the anger ratings could

be predicted by levels of the BIS, when controlling for sex, only Anger Control In was a significant predictor. In light of these findings, research examining social media's impact on anger states should focus on investigating sex differences in anger response, and the rewarding experiences of social media when examining anger.

I. INTRODUCTION

Over the last decade, social media has given individuals an opportunity to freely interact with one another, share ideas and opinions, and even create communities. As such, social media has been a positive tool for many users. However, the widespread opportunity to freely express oneself has, in turn, created new ways to promote negative content that can be passed around--leaving users with potentially undesired negative emotional states and in some cases, affecting real-life behavior. The language used across social media platforms can also create hostility and perceptions of hostility. By consequence, these types of posts can be considered anger-inducing by some, contributing to negative emotional states. Previous research on social media and online aggression has only focused on rates of aggression and victimization within these media (Whittaker & Kowalski, 2015). While some research has attempted to explore this dark side of social media, it is still unclear what personality variables could predict adverse reactions to social media.

It is important to note that not all content shared across social media will cause the same emotional reactions across viewers. Each individual can react differently to the same content but how they ultimately react is not fully understood. One specific area of interest in this field is understanding what individual variables ultimately predict emotional reactions to social media. The extent to which an individual will negatively react to social media content could depend on how motivated they are to react to a particular post. It could also depend on their emotional regulation strategies, such as their tendencies to inhibit their emotions. One particular emotion that has been suggested to

serve as a motivation, despite their negative valence nature, is anger (Harmon-Jones, 2003). There is a plethora of social media content that promotes anger and exposing individuals to posts that can make people angry will be used to further examine individual differences in emotional reactivity to anger-inducing social media posts. With respect to anger, it is important to examine how this emotion is induced by certain social media posts and how it is mediated by motivational activation and inhibition tendencies (Cooper, Gomez, & Buck, 2008), as well as how the expression and control of state anger is related to these two motivational systems. A commonly used measurement of these two systems that has been investigated in a multitude of research is the Behavioral Inhibition System and the Behavioral Activation System (BIS/BAS; Cooper et al., 2008; Harmon-Jones, 2003; Smits & Kuppens, 2005). The relationship between anger and the Behavioral Activation System and the Behavioral Inhibition System has been shown to be positively related (Carver, 2004; Harmon-Jones, 2003). Understanding individual precursors to the experience of anger across social media is crucial. The proposed research will aim to explore individual differences in anger, anger coping styles, and their relation to the Behavioral Activation and the Behavioral Inhibition Systems as predictors of anger ratings to anger-inducing social media posts. With the proposed research, we can begin to understand which individual variables of personality can make social media users more prone to anger in the face of anger-inducing social media content. The first part of the literature will attempt to explore how social media impacts emotional states and mental health. The last part of the literature review will attempt to summarize and compare existing literature on the Behavioral Inhibition System/Behavioral Activation System and its relationship with anger expression and anger control. In order to examine

if individual differences in these variables are associated with emotional reactivity to negative social media posts, a systematic examination of anger expression, and anger control (as indexed by the STAXI), the BIS/BAS and their relationship with the anger ratings elicited by these posts will be the focus of this study.

The Social Media Dilemma

Social media use has been on the rise for over a decade, making it a world-wide phenomenon of the 21st century. Approximately 7 out of 10 individuals use a social media platform in the United States alone (Pew Research Center, 2018) and about 1.2 billion individuals use social media worldwide (Comscore, 2011). Online platforms such as Facebook, Twitter, Instagram, Snapchat, Tumblr, and Reddit offer opportunities to maintain social interactions and share ideas and information (Ellison, Steinfield, & Lampe, 2007; Pew Research Center, 2018). Social media has been widely adopted by younger adults while older adults are less likely to use such applications. Hence, most of the research has focused on younger populations. In fact, a recent study showed that young individuals pervasively use social media, particularly for gaining access to entertainment, for social interactions, for identity formation, and for maintaining meaningful interpersonal connections (Ifinedo, 2016). However, social media sites are looked upon to receive and share information regardless of age (Pew Research Center, 2018). It is also used to express emotions, such as happiness and sadness, across several different platforms in many different forms—e.g., image, text, video (Chung & Zeng, 2018). Although there can be positive benefits to using social media, many problems related to emotionality and mental health have surged with the growth of these online network sites, which will be thoroughly described in the following review.

Social media users have access to specific resources such as information and social support, linking it to positive outcomes, such as reduced stress, that are in turn associated with overall better health (Nabi, Prestin, & So, 2013; Neiminen et al, 2013). Yet, a growing number of studies have also shown negative associations between social media use and mental health, particularly among adolescents and young adults. Among those issues, studies have found that social media use is associated with anxiety, depression, hyperactivity, and impulsivity (Barry et al., 2017) where it was also found that using more social media platforms increased the chances of having increased symptoms of anxiety and depression (Primack et al., 2017). However, having and using more social media platforms alone was not much of a significant predictor for negative mental and physical health as the amount of emotional investment a user has to social media. In other words, having emotional investment to social media is more problematic than having more social media accounts. In fact, emotional investment to social media has been shown to affect sleep, which in turn affects emotional states. For example, Woods and Scott (2016) found that those who are more emotionally invested in social media experienced poorer sleep quality. In addition, when controlling for self-esteem, anxiety and depression—factors that have been consistently associated with poorer sleep quality—emotional investment, along with nighttime specific social media use, significantly predicted poorer sleep quality. These findings suggest that emotional investment may induce arousal and prevent an individual from becoming sleepy, and with poorer sleep quality, anxiety, depression, and low self-esteem may arise (Woods & Scott, 2016). The aforementioned studies have demonstrated a negative association between social media and overall well-being (Barry et al., 2017; Primack et al., 2017;

Woods & Scott, 2016). While these findings are important, no specific connections between social media and particular emotional impact (i.e., what feeling was evoked and how strong it felt) were made. The emotional content found in social media can play a role in negatively affecting overall mental health, especially when there is emotional investment to social media. To explore this problem, more recent studies have offered a better insight into the emotional aspect of social media. It is important to note that social media usage continues to grow due to its most notably information sharing phenomenon, and emotions are often used to promote the transmission of information.

As noted, social media platforms are used to share information, thoughts, opinions, and ideas, and this information-sharing phenomenon has been growing at an unprecedented rate over the last decade. A rising issue in social media research is how social media content is used and consumed, and how this affects individuals' emotional states and behaviors. Social media may have the power to impact emotional states. One possibility for this could be the fact that emotions can be passed around across social media platforms. A longitudinal study by Fowler et al (2008) showed that emotions can indeed be transmitted via social networks and can ultimately have long term effects. In this study it was found that social networks that promoted happy content kept an individual feeling happy and connected—keeping long term relationships (Fowler et al., 2008). In other words, when someone sends content that evokes emotions, those emotions are felt and shared by the user. Such findings are in line with the theory of emotional contagion, which posits that emotions can be shared across individuals either implicitly or explicitly (Hatfield & Cacioppo, 1994). More recent empirical contributions continue to support this idea that online social networks contribute to the spread of

emotions, creating a global emotional synchrony (Corveillo et al, 2014; Kramer, Guillory, & Handcock, 2014). One study showed that affective information can be transferred through computer-mediated communication (i.e., social media networks) and that individuals were able to detect the sender's emotion by associating the message content with positive or negative emotions as well as by utilizing cues from the emotional words, linguistic markers, and paralinguistic cues (Harris & Paradice, 2007).

Research has also suggested that emotional engagement is crucial to social media content virality (Eckler & Bolls, 2011; Taylor et al, 2012). A common social media content that circulates rapidly across a variety of online social networks are “*memes*”. This is defined—typically--as an idea, behavior, or style that evokes an emotional reaction and is passed down in social settings (Dawkins, 1976; Heath, Bell, & Sternberg, 2001). This phenomenon is also observed in digital platforms. A *meme* can become viral if it has the ability to create a strong emotional connection with the intended audiences (Harvard Business Review, 2015). Although positive emotions are a common result of social media consumption, there are individuals who purposely share content that results in negative emotional reactions which may put others at risk for psychological problems and even promote negative online behaviors such as trolling.

Many social media users actively seek to encourage online engagement by creating or sharing emotionally charged content. In fact, within the context of political advertisement in online social networks, Hasell and Weeks (2016) concluded that the anger felt toward an opposing political party was a major predictor of social media engagement. Not surprisingly, levels of anger toward political opposition predicted the number of times news stories were shared across social media (Berger & Milkman,

2011). In addition, another study showed that advertisements that effectively invoked anger and fear ultimately encouraged audience engagement (Vargo & Hopp, 2020). Such content included condescending language against a person's identity status (e.g., race, sexual orientation, gender, immigration status), provocative language, crude language, and threatening language (e.g., direct retaliatory words used against a particular individual or groups)—suggesting that negative emotions (e.g., anger and fear) boosted the amount of online audience engagement. Despite these findings, not all individuals fall prey to certain emotionally charged content. In fact, this same study also found that posts that had condescending language against another person's identity, (e.g., based on race, sexual orientation, gender, immigration status), received the lowest levels of audience engagement (Vargo & Hopp, 2020). While these studies provided insight into what promotes social media engagement overall, these studies did not explore individual differences in emotional reactivity. It is clear that emotions are crucial to the transmission of information, but who is more prone to react and individual variations in reaction are not fully understood. While some online content can evoke emotions and potentially lead to actions, not everyone reacts the same way. At the individual level, emotional reactivity to social media content is dependent on the individual construal of relevant stimuli—and even perhaps with other individual factors, such as emotional regulation.

It is important to acknowledge that the content individuals produce or share across social media sites might impact other's emotional states, but exactly how each individual is affected by this is not fully understood. There is an immense variation across each individual, and how they will react will depend on their unique individual differences. One relevant domain to explore is individual differences in anger experience and

expression. Anger experience relates to the emotional state a person is feeling, while anger expression deals with how an individual decides to express it outwardly. However, it is important to note that not behaviors are a direct manifestation of emotional states, partly due to emotional regulation strategies (Gross, 1998). Examining individual factors could potentially give us insight into what variables can serve as predictors of negative online emotional reactivity and particularly online aggressive behaviors. Since anger is a high arousal negative emotion, one could posit that this emotion can serve as a motivational drive (Harmon Jones, 2003). Hence, any subsequent reaction could be driven by this emotion. After all, the aforementioned research studies have demonstrated that emotions ultimately predict online engagement and content virality. The extent to which an individual will negatively react to social media content could pertain to the intensity of the motivation and their impulse control. Several theorists have argued that two general motivational systems underlie behavior: the behavioral activation system and behavioral inhibition system. It is important to examine how anger, induced by certain social media posts, is related to these two systems, as well as how the expression and control of such emotion is related to the behavioral inhibition system and the behavioral activation system.

BIS/BAS

The extent to which an individual will be more prone to react during emotional experiences can depend on the intensity of the motivational direction. One widely used measure of these systems (i.e., motivational systems) that has been investigated in a multitude of research is the Behavioral Inhibition System and the Behavioral Activation System (BIS/BAS). It has been suggested that these two systems are a core mechanism of

the regulation of emotion and behavior (Depue & Iacono, 1989; Fowels, 1980; Gray, 1987, 1990) and they underlie stable personality traits (Cloninger, 1988; Depue & Collins, 1999; Gray, 1990). The Behavioral Inhibition System is theorized to be sensitive to signals of punishment, inhibiting behavior that may lead to negative or painful outcomes. Hence, the BIS has been related to the experience of negative emotions (Arnett & Newman, 2000; Carver & White, 1994; Gray, 1987, 1990). The BIS/BAS is a self-report measure consisting of one subscale that measures the degree to which an individual moves away from something unpleasant (Carver & White, 1994), and a set of subscales indexing the strength of the BAS, which is thought to be sensitive to signals of reward, directing behavior towards an acquisition of rewards or opportunities to avoid punishment (Carver & White, 1994; Depue & Iacono, 1989). The BAS measures 3 dimensions of appetitive drives: Reward Responsiveness, Drive, and Fun Seeking. Reward Responsiveness measures the degree to which rewards lead to positive emotions, Drive reflects a person's tendency to actively pursue appetitive goals, and Fun Seeking is measuring the tendency to seek out and impulsively engage in potentially rewarding activities (Carver & White, 1994). In older conceptions of this model, the BAS has traditionally been associated with positive, approach-related emotions (Carver & White, 1994). Nevertheless, more recently, the idea that the approach motivation system is only associated with positive affectivity has been challenged with proponents arguing that state anger is also an approach-related emotion that should also engage the BAS (e.g., Harmon-Jones, 2003).

As mentioned, anger can be considered a negative emotion that can have an approach motivated component, associating it with the Behavioral Activation System

(Harmon-Jones, 2003). Subsequent studies have shown that BIS/BAS may not be exclusive to either positive or negative emotions (Carver, 2004; Corr, 2002; Harmon-Jones, 2003). Hence, anger has been hypothesized to result from engagement of both the BIS and BAS. Consistent with this idea, Smits and Kuppens (2005) showed that trait anger was positively related with the BIS and the BAS Drive scale as well as the BAS Reward Responsiveness. Such findings suggest that BAS and negative affect independently contribute to anger and that its relationship with BIS may be due to negative affect. A possible reason that has been suggested for the consistent finding that trait anger is associated with Behavioral Activation System Drive (BASD) may be found in appraisal theories of emotion (Averill, 1983; Kuppens, Van Mechelen, & Meulders, 2004). This theory posits that emotions are elicited and differentiated based on an individual's subjective evaluation of the situation/stimulus, and therefore, BIS and BAS may engage differently depending on the individual's appraisal of stimulus (Scherer, 1999). To further clarify how these two systems are engaged by anger, research has also examined whether different styles of anger expression are systematically related to BIS/BAS profiles. How an individual decides to direct anger on social media (e.g., to engage or withdraw) will be influenced by their anger expression styles.

Anger and Anger Expression

Research has conceptualized the experience of anger consisting of two main components: state and trait anger (Averill, 1983; Spielberger, Johnson, & Jacobs, 1982). Trait anger measures a trait disposition to experience angry feelings, while state anger measures the intensity of anger as an emotional state at a particular time (Spielberger, 1999). The focus of the current study will be on state anger, namely, acute responses to

different social media posts. However, it is important to note that self-reported anger is the result of an appraisal process that can be influenced by emotion regulation strategies and expressive styles. As such, the inward experience of anger and its outward expression are two distinct concepts. Anger experience refers to the subjective emotional state that one feels along with the accompanying physiological responses. On the other hand, anger expression refers to the behavioral dimension that is one's way of communicating the feeling of anger. Anger expression styles can be categorized into the following three types: anger-in, anger-out, and anger-control (Spielberger, Jacobs, Russell, & Crane, 1983). Anger-out is characterized by the tendency to express anger outwardly, directed either towards a person or an object, suggesting an approach-oriented action (Frijida, 1986; Kuppens, Van Mechelen, & Meulders, 2004). On the other hand, anger-in refers to the tendency to direct anger inwards, suggesting that anger is regulated by suppression (Greenglass, 1996; Julkunen, 1996; Schwenkmezger & Hank, 1996). Anger-control is defined as making an effort to control and manage anger and express the feeling of anger while respecting the rights and emotions of the other person, using words that are not aggressive (Spielberger et al., 1983). Intuitively, it makes sense that anger-out tendencies would predispose an individual to engage (approach/BAS), while anger-in tendencies would make withdrawal (avoidance/BIS) more likely, and anger-control might engage both the BAS and BIS.

To examine the relationship between anger expression and the motivational direction systems, Smits and Kuppens (2005) found in their second study that measures of anger-out were positively related to BAS and negatively related to BIS. This supported the idea that not only anger-out is an approach-oriented action but that the lack of

inhibition to the behavioral tendency was reflected by low levels of the BIS measurement. In contrast with their previous study, BIS was shown to be associated with higher anger-in scores and the BAS with anger-out scores, whereas the BIS and BAS were both related to trait anger in their previous study. The negative association between trait anger and the BIS is primarily due to the fact that both are associated with negative emotionality and that the expression of anger is regulated by motivational systems. This suggests that the expression of anger may not be a true manifestation of subjective experience, rather, it depends on individual predispositions to either approach or withdraw from anger-inducing stimuli or situations. Corresponding to anger-out expressive style, physical and verbal aggression were found to be positively related to BAS and negatively related to BIS when state anger was accounted for (Harmon-Jones, 2003; Smits & Kuppens, 2005). However, when controlling for state anger, the regression showed that anger-out coping style and aggression scales had no associations with the BAS but the negative association with the BIS remained (Smith & Kuppens, 2005). This suggests that acts of aggression are primarily due to a lack of inhibition (low BIS activity) rather than high levels of activity in the BAS. Hence, while it is intuitive to expect social media posts would prompt an individual to respond aggressively via activation of the BAS, a lack of engagement of the BIS may also give rise to outward expressions of anger. Therefore, anger-out tendencies arise from the combined influence of both motivational systems, which may vary depending on exactly how the anger is expressed (e.g., verbally vs. physically, reflexively vs. reflectively). If both systems contribute to anger expression, their combined influence should be most evident when anger is controlled.

Anger Control

Anger is viewed as the drive or motive behind different forms of aggression. In other words, anger typically precedes aggressive impulses (Avrill, 1983). However, not all aggressive acts are preceded by anger and not all anger is followed by aggression. As previous studies have noted, the expression of anger seems to be more dependent on strength of activation of the BIS vs. the BAS. However, it is possible that both systems are involved to varying degrees, depending on how the anger is expressed. Individual high in anger-control tendencies may still express anger both outwardly and inwardly, but do so in a more controlled, reflective manner indicative of behavioral inhibition. Furthermore, the STAXI-2 distinguishes between two subtypes of anger control; Anger Control-Out measures the inhibition of the expression of anger outwardly towards others, whereas Anger Control-In measures to what extent angry feelings are suppressed internally (Spielberger, 1999). For example, when reacting to a social media post, one could feel anger but control its expression (Anger Control-Out), or one could suppress, ignore, or reappraise the subjective experience and its inward experience. One study examined how trait individual differences in BIS and BAS relate to a wide range of anger responses to specific anger inducing scenarios. In this study, high scores on BIS and low scores on BAS related to holding anger responses in (anger control-in) and when involving approach-oriented actions high BAS and low BIS would relate to anger responses (Cooper, Gomez, & Buck, 2008). The BAS-Drive subscale was negatively associated to the control of angry feelings. It was also found that when coupled with the BIS, BAS-Drive predicted anger arousal. It has been noted that having a high drive towards a goal but also having high inhibition traits can induce emotional arousal

(Cooper, Gomez, & Buck, 2008). Therefore, it is possible that individuals who are high in BAS-Drive will experience anger in the face of anger-inducing social media posts but will moderate their responses or choose not to act on this drive because they are also high on BIS. As such, these individuals would reflect higher anger control-out scores because while the emotion is still present, they will not act on it.

The present study

The purpose of this study was to examine relationships between state anger (evoked by negative social media posts) anger expression styles, and the BIS and BAS. Specifically, expression styles and the BIS/BAS were examined to determine whether they can predict emotional reactivity, specifically anger reactivity, to social media posts. First, to determine if anger-inducing social media posts did in fact elicit anger responses in participants, a baseline assessment of state anger (STAXI2 subscale) was conducted prior to viewing the social media posts. Participants viewed 30 social media posts that were previously rated as anger-inducing and asked to rate each one on how angry it made them feel, both as a manipulation check and as a criterion variable for multiple regression. After viewing all social media posts, they completed the same 15-item STAXI State Anger subscale in order to detect changes in state anger due to viewing the posts. No previous studies have examined the role of impersonal social media posts on individual emotional reactivity, specifically anger. That is, the stimuli used in this study will use social media content that is not directed towards the user itself but rather content that promotes negative evaluations of others, violent images, animal threat, and foul language used against specific groups of people. With respect to the STAXI-2, State Anger measures the intensity of angry feelings as well as the extent to which an

individual wants to express anger verbally and physically. State Anger is also thought to be as a result of environmental changes (Spielberger, 1999). Therefore, it is hypothesized that the social media posts will lead to a change in anger responses from baseline, such that state anger will be higher after viewing the posts.

To examine if individual differences can predict emotional reactivity, a systematic examination in anger expression, anger control (as indexed by the STAXI), and BIS/BAS scales and their relationship with anger ratings to negative social media posts, were the focus of this study. Based on previous studies, also it is also hypothesized that both BIS and BAS scores will positively correlate with anger ratings in response to anger-inducing social media posts. I also hypothesized that anger-control and anger expression-in will be positively associated with the BIS and negatively associated with the BAS. Such results could help us understand the negative effects of social media and how individual differences in the experience, expression, and control of anger can be used to predict emotional reactions to negative posts, enriching our understanding of the effects of social media consumption on emotional states and mental health.

II. METHODS

Participants

A total of 411 students from Texas State participated in this study. Data from 104 participants were removed from the sample due to missing data on the STAXI, anger ratings, and BIS/BAS, which prevented the calculation of full-scale scores for use in the analyses. The remaining 307 participants, with 5 missing sex and 7 missing ages, were retained and used in the final analysis, 82.7% of whom were females and 16.6% males, ranging from 18-59 years of age ($M = 20.32$, $SD = 4.23$). The majority of the participants were white (67.1%), 11.4% black, 1.6% American Indian/Alaska Native, 2.9% Asian, 5.2% were other, and 11.7% did not report their race. 42.7% of the participants reported to be of Hispanic origin.

Measures

Demographic questionnaire. Participants reported their age, sex, gender, race, ethnicity, social media use, social media platforms used, political affiliation, and highest level of education achieved.

The Spielberger State-Trait Anger Expression Inventory-2 (STAXI-2). The STAXI-2 (Spielberger, 1999) is a 57 item self-report measure of state and trait anger. The STAXI-2 is composed of several subscales: Trait Anger, Anger Expression-out, Anger Expression-In, Anger Control-out, and Anger Control-In. Trait anger measures a trait disposition to experience angry feelings. Anger Expression-Out measures the degree to which an individual express anger outwardly at other individuals or objects, while Anger Expression-In measures the suppression of angry feelings. Anger Control-Out measures

the prevention of the expression of anger outwardly towards others, while Anger Control-In measures the degree to which angry feelings are suppressed internally.

Anger ratings. Participants rated the anger-inducing social media posts on a scale from 1-100. The higher the score, the more anger elicited by the social media post.

The BIS/BAS Scales. The Carver and White (1994) BIS/BAS Scales are a widely used measure of trait individual differences in BIS and BAS levels. The BIS/BAS Scales consist of a total of 20 items, with each item rated on a four-point Likert scale. The BIS/BAS Scales have a single scale for the BIS and three BAS scales: Reward Responsiveness, Drive, and Fun Seeking. Reward Responsive-ness comprises items reflecting the degree to which rewards lead to positive emotions, Drive comprises items reflecting a person's tendency to actively pursue appetitive goals and Fun Seeking comprises items measuring the tendency to seek out and impulsively engage in potentially rewarding activities.

Stimuli

A total of 70 social media posts that were originally taken from real social media platforms were used to norm them as either anger-inducing or humorous. In order to increase the experience of anger from social media posts, all social media posts rated as humorous or anger and humorous were not used in the present study. These social media posts were taken from Facebook, Twitter, Tumblr, and Instagram. All identifiable information from social media users, such as usernames and profile pictures, and faces were blurred and removed from the norming. Data from users' engagement to these posts (i.e., number of likes on FB, or Retweets on Twitter) were also removed or blurred. All

the social media posts were in color and some of those images contained profanity—all profane words were blurred from the study. A total of 542 participants participated in the social media post rating. Following each social media post, participants rated their perception to the post from a 4-point Likert-scale. For each social media post each participant rated to what extent did the post make them angry and if they found it to be amusing/humorous. Principal Component Analysis (PCA) was conducted to assess whether it was reasonable to interpret the measured variables as measures of the same latent construct (i.e., Anger and Amusement). PCA showed that 30 out of the 70 posts had high factor loadings (above .05) reflecting only one latent factor, and that those 30 social media posts, based on their content, related to the construct of anger.

The 30 social media posts with high factor loadings (i.e., anger) were used in the present study as anger-inducing social media posts (see appendix A).

Procedure

We recruited participants via SONA from several different introductory psychology courses, as well as via CANVAS site announcement from a Brain and Behavior course at Texas State University. Participants were told that they were taking part in a study on emotional reactions to social media posts and were given a link that prompted them to a Qualtrics survey that began with informed consent, as well as self-report surveys and social media posts. All participants read the study's consent form and agreed to participate prior to being redirected to the actual survey. Following completion of the consent form, they were prompted to complete a demographic questionnaire followed by a baseline assessment of state anger as indexed by the state anger subscale of the STAXI-2 (Spielberger, 1999). Participants then viewed 30 anger-inducing social

media posts in randomized order and were asked to rate, from a scale of 1-100, how angry each posts made them feel. After providing these ratings, they once again completed the state anger subscale questionnaire from the STAXI-2 in order to detect changes in state anger. Soon after, participants viewed 20 positive social media posts and were asked to rate their mood, from a scale of 1-100, after viewing these social media posts. This was done to counteract any negative effects that may have been elicited by viewing the previous anger-inducing social media posts. Participants then completed the Behavioral Inhibition and Behavioral Activation System questionnaire (BIS/BAS) and the rest of the STAXI-2 questionnaire (Anger Expression In, Anger Expression Out, Anger Control In, Anger Control Out, State Anger, and Trait Anger).

Analytic Strategy

Manipulation check. In order to test the first hypothesis that the social media posts would elicit anger, a paired samples *t*-test was conducted comparing state anger at baseline to state anger measured after viewing the posts.

Preliminary Correlations. Diagnostic preliminary correlations were conducted to examine relationships between predictors to determine whether the use full-scale scores were appropriate or if subscale scores could be employed in the analysis. Correlations were also used to ensure that collinearity were not an issue in the final analyses. Correlations between subscale scores on BIS/BAS and STAXI-2 were used to test the hypothesis that anger control and anger expression in were positively associated with the BIS.

Independent samples t-test. To detect sex differences in scores across the BIS/BAS and STAXI-2 scales, and anger ratings, an independent samples t-test was conducted.

Regression analysis. To test the hypothesis that both BIS and BAS will predict anger ratings a multiple regression was conducted. The independent variables in this study will be trait anger, anger expression, anger control, and the BIS/BAS scales. The dependent variable was social media posts anger ratings.

III. RESULTS

Preliminary analysis showed that only race and age had some missing demographic variables, but they were not excluded from the data because they had no significant impact on our analysis. The Shapiro-Wilk test indicated that all variables violated assumptions of normality. However, given the sample size and the statistical analytic strategies used (i.e., t-test, regression), violations of normality were not a cause of concern. GLM models are more robust and can allow for non-normality, particularly when there is a big sample size. In fact, previous studies have suggested that the use of parametric tests, such as t-test, are more robust against non-normality and there is no need to use non-parametric counterparts as it cannot be considered a very strong requirement for parametric tests' application. (Ghasemi et al, 2012). In fact, parametric tests are preferred over its non-parametric counterparts as they have been found to be superior in simulation studies (Rasch & Guiard, 2004).

Manipulation check

A paired-samples *t*-test was conducted to detect changes in state anger from baseline after viewing the social media posts. State anger at baseline ($M = 17.90$, $SD = 5.93$) was significantly lower than state anger after viewing the posts ($M = 24.41$, $SD = 9.96$), indicating that the posts were successful at eliciting anger; $t(306) = -12.99$, $p < .001$. The mean state anger change was ($M = -6.50$, $SD = 8.77$).

Correlations between the BIS/BAS Scales and the STAXI-2

Table 1 shows the means and standard deviations for the BIS/BAS and the STAXI-2 measures. Table 2 shows the correlations between the BIS/BAS and STAXI-2

subscales. It can be seen in Table 2 that BIS correlated significantly and positively with Trait Anger and Anger Expression In. BAS-Drive, BAS-Reward Responsiveness, and BAS-Fun Seeking significantly correlated with Anger Expression Out. The BIS was not significantly correlated with Anger Control Out or Anger Control In but it was positively and significantly correlated with Anger Expression In and Trait Anger. BAS-Reward Responsiveness also significantly correlated with Anger Control Out and Anger Control In. Both BAS-Reward Responsiveness and BAS-Fun Seeking significantly correlated with Anger Control In and only BAS-Fun Seeking correlated with Anger Expression In.

Table 1. Descriptive Statistics for the BIS/BAS and STAXI-2 measures

	Mean	Std. Deviation
BIS	21.56	3.38
BAS Reward Responsiveness	17.71	2.04
BAS Drive	10.98	2.47
BAS Fun Seeking	12.07	2.62
Trait Anger	18.40	5.25
Anger Expression Out	15.11	3.64
Anger Expression In	19.45	4.49
Anger Control Out	23.58	4.96
Anger Control In	22.04	5.10

Table 2. Correlations between the BIS/BAS and the STAXI-2 measures

	Trait Anger	CI Lower Upper	Anger Expression Out	CI Lower Upper	Anger Expression In	CI Lower Upper	Anger Control Out	CI Lower Upper	Anger Control In	CI Lower Upper
BIS	.204**	.093, .319	.086	-.014, .213	.263*	.165, .387	-.063	-.212, .018	-.032	-.181, .043
BAS Reward Responsiveness	.111	-.101, .161	.125*	-.132, .129	.101	-.149, .108	.131*	.046, .312	.251*	.112, .371
BAS Drive	.062	-.119, .140	.174*	-.013, .247	.096	-.060, .195	.034	-.166, .098	.127*	-.148, .109
BAS fun Seeking	.111	-.017, .233	.189*	.023, .272	.116*	-.010, .235	.018	-.168, .085	.169*	-.043, .205

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

Social media posts: Anger Ratings

To assess the dimensionality of the 30 social media posts ratings before using an aggregate ratings scores for the analysis, factor analysis was performed using PAF, the default criterion to retain factors with eigenvalues greater than 1, and varimax rotation was requested. Each rating item consisted of self-reported ratings for each of the 30 social media posts viewed. Each item was rated on a scale that ranged from 0 (“This post does not make my angry”) to 100 (“This post makes me angry”).

In the initial factor solution that consisted of 30 factors, only 3 factors had eigenvalues greater than 1. However, Factors 2 and 3 accounted for a relatively small percentage of the variance in ratings: 6.58% and 3.78% respectively. Therefore, only Factor 1 was retained and rotated. After varimax rotation, Factor 1 accounted for 54.53%

of the variance. Rotated factor loadings (see Table 3) were examined to assess the nature of the retained varimax-rotated factors. An arbitrary criterion was used to decide which factor loadings were large. A loading was interpreted as large if it exceeded .50 in absolute magnitude. Only 14 out of the 30 social media posts ratings had high loadings on the latent factor, which based on previous norming and its imagery content (see appendix), could be labeled as “Anger”. These 14 ratings were used to create an aggregate anger ratings score.

Table 3. Rotated factor loadings from confirmatory PCA (varimax rotation)

	Social Media Post Ratings
	Factor 1 loadings: "Anger"
SM Post 1	.196
SM Post 2	.370
SM Post 3	.313
SM Post 4	.310
SM Post 5*	.834
SM Post 6	.169
SM Post 7	.300
SM Post 8*	.529
SM Post 9*	.694
SM Post 10*	.874
SM Post 11	.393
SM Post 12	.402
SM Post 13	.323
SM Post 14	.425
SM Post 15	.426
SM Post 16*	.830
SM Post 17*	.526
SM Post 18*	.583
SM Post 19*	.774
SM Post 20*	.582
SM Post 21	.283
SM Post 22	.382
SM Post 23*	.812
SM Post 24*	.700

SM Post 25*	.720
SM Post 26	.174
SM Post 27	.385
SM Post 28*	.705
SM Post 29	.073
SM Post 30*	.685

Sum of squared loadings 16.36; Factor accounted for 54.53% of variance in anger ratings.

*** Social Media (SM) Posts with Factor Loadings < .05**

Correlations between the BIS/BAS Scales and the Anger Ratings

An independent samples *t*-test indicated that there was a significant difference between males ($M= 69.29$, $SD=28.45$) and females ($M= 83.94$, $SD= 19.58$) with respect to anger ratings to the posts, with females scoring higher than male participants, $t(303) = -4.480$, $p < .001$. The mean anger rating scores across all participants ($M= 81.32$, $SD= 22.27$) confirmed that the social media posts were successful in inducing anger.

Independent samples *t*-tests indicated that there were no significant differences between males and females on the BIS/BAS and STAXI-2 scales.

Table 4 shows the correlations between the BIS/BAS, the STAXI-2 subscales, the change in state anger (post-viewing minus baseline), and the Anger Ratings. The anger ratings were significantly and positively related with the BIS, BAS Drive, and BAS Fun Seeking. BAS Reward Responsiveness was not significantly related to the Anger Ratings. Anger ratings also significantly correlated with the state anger change.

Table 4. Correlations between the BIS/BAS, SAXI-2, State Anger Change, and the Anger Ratings

	Anger Ratings	Confidence Interval Lower, Upper Bound
BIS	.146	.050, .277
BAS RR	.074*	-.173, .090
BAS D	.116	-.041, .220
BAS FS	.135*	-.001, .250
Trait Anger	.118*	-.093, .214
Anger Expression Out	.159*	-.014, .268
Anger Expression In	.112**	-.086, .172
Anger Control Out	.049	-.186, .136
Anger Control In	.117	.014, .320
State Anger Change	.350**	

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

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

Examining predictors of Social Media Anger Ratings

In order to examine predictors of social media anger ratings, a multiple regression was conducted using the BIS/BAS and STAXI-2 scales to predict anger ratings, accounting for all participants. A significant regression equation was found ($F(9,297) = 2.838, p < .05$, with an R^2 of .079. Participants' predicted anger ratings is equal to $28.492 + 1.012$ (BIS). Only BIS was a significant predictor of anger ratings, $p < .05$. It was found that BIS positively predicted anger ratings. Table 5 shows the unstandardized beta weights, standard errors, with beta CI.

Table 5. Coefficients from the multiple regression using BIS/BAS and STAXI-2 scales as predictor variables and anger ratings as the criterion

Model		95.0% Confidence Interval			
		Unstandardized Coefficients		for B	
		B	Std. Error	Lower Bound	Upper Bound
1	(Constant)	28.492	14.538	-.117	57.102
	BIS*	1.012	.398	.228	1.796
	BAS RR	-.869	.746	-2.336	.599
	BAS D	.713	.598	-.465	1.890
	BAS FS	.775	.550	-.307	1.858
	Trait Anger	.226	.332	-.428	.880
	Anger Expression Out	.716	.443	-.155	1.587
	Anger Expression In	-.029	.332	-.682	.624
	Anger Control Out	.057	.369	-.669	.782
	Anger Control In	.611	.351	-.079	1.302

a. Dependent Variable: Anger Ratings

* Significant at the 0.05 level

However, a previous examination of demographic variables (see Table 4) indicated that anger responses were significantly different based on Sex, a new multiple regression model was examined using BIS/BAS scales as predictor variables while controlling for Sex (dummy coding for females). All other demographic variables were examined (i.e., Age, Race, Political Affiliation) but they did not significantly correlate or predict social media anger ratings. In order to keep the model parsimonious, and because there was no significant relationship, these variables are not shown in the results. A significant regression equation was found when controlling for sex ($F(10, 296) = 4.353, p < .005$). The model had an R^2 of .128. Only Anger Control In was a significant predictor of Anger Ratings, $p < .05$, while BIS had a marginal significance in predicting Anger Ratings, $p = .07$. Anger Control In positively predicted anger ratings. As scores in Anger Control In go up so does the anger ratings. Table 6 shows the regression model summary

after controlling for Sex. A multiple regression including only females was conducted to examine BIS/BAS and STAXI as predictor variables of anger ratings. No significant regression equations was found using only females in the regression model ($F(9, 244) = 1.125, p = .345$).

Table 6. Coefficients from the multiple regression using BIS/BAS and STAXI-2 scales as predictor variables when controlling for Sex (females)

Model		Unstandardized Coefficients		95.0% Confidence Interval for B	
		B	Std. Error	Lower Bound	Upper Bound
1	(Constant)	68.772	2.961	62.946	74.599
	Female	15.170	3.255	8.764	21.575
2	(Constant)	26.946	14.174	-.949	54.841
	Female	13.662	3.349	7.072	20.252
	BIS	.703	.396	-.075	1.482
	BAS RR	-.973	.727	-2.405	.458
	BAS D	.632	.583	-.517	1.780
	BAS FS	.624	.537	-.433	1.682
	Trait Anger	.197	.324	-.440	.834
	Anger Expression Out	.691	.432	-.158	1.540
	Anger Expression In	-.082	.324	-.720	.555
	Anger Control Out	.134	.360	-.574	.842
	Anger Control In*	.684	.342	.010	1.358

a. Dependent Variable: Anger Ratings

* Significant at the 0.05 level

IV. DISCUSSION

Social media has the power to affect people's emotional states and promote a gamut of positive and negative reactions. The focus of the current study was to better understand individual differences in reactivity to social media posts chosen to elicit anger. To confirm if the social media posts used in the present study resulted in an increase of state anger, state anger (as indexed by the STAXI-2) was assessed prior to and after viewing inflammatory posts. Results showed that state anger significantly increased after viewing the posts, confirming that they were successful in promoting the angry reactions. Thus, supporting our first hypothesis. However, because not everyone experienced the same degree of anger in the face of these posts, a systematic examination of individual differences in BIS/BAS and STAXI-2 scores and their relationship to anger ratings obtained to each of the posts was conducted. The hypothesis that anger control and anger expression, as indexed by the STAXI-2, would positively associate with the BIS was partially supported. Correlations between BIS/BAS and STAXI-2 subscales showed that the BIS was correlated significantly and positively with Trait Anger and Anger Expression In subscales of the STAXI2. BAS-Drive, BAS-Reward Responsiveness, and BAS-Fun Seeking significantly and positively correlated with Anger Expression Out. BAS-Reward Responsiveness was also significantly and positively correlated with Anger Control Out and Anger Control In. Together, these results reveal some insight into how the BIS and BAS are related to the experience and expression of anger. Individuals who have a more active BIS may be more likely to express anger inwardly, and the internalization of anger in individuals with this expressive style may be manifested as a more enduring, trait-like disposition as indexed by the trait anger subscale of STAXI-2.

In addition, BAS tendencies were also related to the expression of anger, suggesting that anger can be approach related.

In order to test if the aforementioned personality variables help predict anger reactions to social media posts, a multiple regression was conducted. Results revealed that only BIS was a significant predictor of social media anger ratings. However, as previously mentioned, sex differences in social media anger ratings showed that females were more angered than men. Due to this, a new regression model controlling for sex showed that only Anger Control In significantly predicted social media anger ratings, irrespective of the BIS. Such findings can indicate that the internalization of angry feelings can promote anger experience in the face of anger-inducing social media. To further explore sex differences, a new regression model was conducted to examine if the BIS/BAS and STAXI variables can predict angry ratings in females. However, no significant findings were found in this model, suggesting that other unexplored variables most likely influenced females to become more angrier than men. Each finding will be thoroughly discussed below.

The purpose of this study was to examine the systematic relationships between the BIS/BAS, anger expression, and anger control (as indexed by the STAXI) to anger ratings of negative social media posts. In order to ensure that the social media posts adequately induced anger, a baseline assessment was conducted to detect changes in state anger. Consistent with the first hypothesis, viewing the social media posts led to a change in state anger. Furthermore, participants rated the posts as anger-inducing. With these ratings, social media posts that contained elements of racism and sexism (see appendix

A) were identified as posts that induced anger across participants. It is clear that the use of such posts contributes to a change in state anger, as indexed by the STAXI-2.

The hypothesis that anger control and anger expression, as indexed by the STAXI-2, would be positively associated with the BIS was partially supported. While Anger Expression In significantly and positively correlated with the BIS, Anger Control was not correlated with the BIS. In fact, Anger Control In was positively correlated with BAS-Drive, BAS-Reward Responsiveness, and BAS-Fun Seeking. Moreover, BAS-Drive, BAS-Reward Responsiveness, and BAS-Fun Seeking were also positively correlated with Anger Expression Out. These findings support the recent notion that the BIS and BAS systems are not exclusive to a particular affective state. Originally, Carver & White (1994) tied this idea that the BIS is associated with negative emotions and the BAS with positive ones. This intuition was challenged when anger was instead associated with the BAS rather than the BIS, highlighting that anger can be an approach related emotion (Harmon-Jones, 2003). Rather than being associated with a particular affective state, the BIS and BAS systems fluctuate depending on the contextual properties of the situation, and how an individual interprets the stimuli (e.g., positive, or negative).

According to the Reinforcement Sensitivity Theory (RST) both the BIS and BAS are hypothesized to be sensitive to conditioned stimuli, where BIS is thought to be sensitive to signals of punishment while the BAS is sensitive to signals of reward (Gray, 1970). It is possible that for some individuals, expressing anger could be a rewarding experience for a particular situation but not during another. Hence why it could be associated with both the BIS and BAS. In fact, a recent modification to the RST has postulated the joint subsystem hypothesis which posits that both the BIS and BAS will either facilitate or

antagonize response to aversive or appetitive stimuli (Corr, 2002). It is still unclear what signals, or aspects, of social media an individual is more sensitive. Future research should aim at controlling and manipulating events that are in accordance with an individual's salient perceptions of rewards and/or punishment, especially with respect to social media. For example, collecting information that shows what an individual perceives as rewarding in social media to attain better experimental control. The current findings, however, continue to support Carver's (2004) notion that negative emotions such as anger, elicited by the social media posts, can be associated to the BAS rather than the BIS alone.

The hypothesis that both BIS and BAS will positively correlate with the anger ratings was supported. When examining the bivariate correlations between the social media anger ratings and the BIS/BAS it was found that the BIS, BAS Drive, and BAS Fun Seeking positively correlated with the anger ratings. Such relationships seem to indicate that the BAS's relationship with the anger ratings could simply reflect a desire to respond since anger was present, but since the opportunity to do so was not provided in the present study; rather, participants were asked how angry the post mad them feel. Such findings could be in line with Smith's and Kuppens (2005) findings that the BAS system is mediated by anger. In their study, anger-out and aggression scales had no associations with the BAS when state anger feeling was controlled. Further studies should conduct a mediation analysis with state anger when examining its relationship with the BAS to examine this possibility. The associations between anger with the BIS also indicate that individuals tend inhibit their impulses but the drive, as manifested by BAS scores, is still present. This could explain why participants were angered by the posts. Perhaps having a

high drive while having high inhibition traits will make an individual more prone to be emotionally aroused (Cooper, Gomez, & Buck, 2018). With respect to anger scenarios, having a high drive to pursue a potentially rewarding experience (e.g., retaliation) but also having self-control will ultimately leave an individual with angry feelings. However, it is important to note that these were simple correlations, and no cause or effect should be presumed. Nevertheless, these correlations can help illustrate how interrelationships between these variables can be observed. Future studies should attempt to test these relationships further.

In order to test if the aforementioned variables, and their relationship, can serve as predictors of social media anger ratings a multiple regression was conducted—firstly by examining the sample as a whole. When examining these predictors, it was found that only the BIS positively predicted anger ratings. Despite being the only predictor, the BIS was previously shown to be correlated with the anger ratings. Although the relationship between social media anger ratings and the BIS is most likely quite complex, on a broader scale we can suggest that high BIS could be associated with internalization of angry feelings. After all, findings also showed that Anger In was significantly correlated with the BIS. Although the relationship between the BIS and Anger In was weak and did not pose a collinearity threat in the final regression, the observed relationship gives us a general idea of their associations and it certainly merits further investigation. With respect to the social media posts, individuals who use this particular inhibition mechanism could be more prone to experience anger in the face of anger-inducing social media.

However, it is important to note the statistically significant differences on the anger ratings between males and females. One possible explanation for the score discrepancies in anger ratings could be found on how men and woman report different emotional reactions. It has been noted that women describe more intense emotions than men (Fischer & Manstead, 2000; Fujita, Diener, & Sandvik, 1991) especially during moral dilemmas involving harm (Friesdorf, Conway, & Gawronski, 2015). The social media posts used in the present study displayed topics involving racism, sexism, homophobia, and transphobia. In contrast, men may be prone to inhibit guilt when considering moral dilemmas and show less emotional expression (Hess et al., 2000). As previously noted, when examining the content of the social media posts, it was found that most of the social media posts were racists (8 out of 14), as well as sexist posts (4 out of 14), and homophobic and transphobic (2 out of 14). It is still unclear how such content makes women angrier than men, but based on this study, social media posts that included the use of such topics were more upsetting to females than males. It is important to highlight that this study did not include proper qualitative content analysis on the social media posts. Therefore, future studies should aim at quantifying the content of social media posts before examining sex differences in emotional reactions. Future studies should also seek to include more males in their samples. The present study did not have a large enough sample of males to make accurate conclusions for men. Therefore, replication studies are needed with more males in their samples.

When reexamining the predictors of social media anger ratings after controlling for sex, it was found that only Anger Control In was a significant and positive predictor of anger ratings, while the BIS had a marginal significance. Once again reiterating the

notion that internalization of angry feelings can also lead to individuals feeling angrier in the face of anger-inducing social media. Hence, Anger Control In was predictive of social media anger ratings. Further research could attempt to examine internalization of anger feelings beyond anger measurements such as anger expression styles. Future studies should consider examining different emotional regulation strategies (e.g., ruminations, reappraisals) to better understand anger in the face of anger-inducing social media.

Furthermore, when examining if the BIS/BAS and STAXI variables could also predict anger ratings in females, it was found that the aforementioned predictors did not predict anger ratings in females. The present study did not find any significant conclusions with respect to anger experience in females alone when viewing anger-inducing social media posts. More needs to be explored with respect to anger experience in females when viewing social media posts. Future studies should aim at exploring other predictors of anger experience, relevant to the content of the posts, across social media when studying sex differences. Following the previous notion that females report more emotional experiences than men when a moral dilemma is involved, the content of the social media posts could be an indication of what could anger women more as opposed to men. Future studies should consider examining pertinent factors that could predict anger experience in females when viewing upsetting social media posts. Any pertaining factor can be seized from the content of the social media posts themselves. When examining the content of the social media posts, women reported to be angrier than men when the social media posts included topics involving racism, sexism, homophobia, and transphobia.

In light of the social media content analysis, it is important to report that no other factors were collected that could have explained why these posts were more anger-

inducing than others, especially for women. If future studies aim to explore emotional regulation strategies or sex differences with respect to emotional reactions to social media posts, more relevant factors should be included that could explain these differences. For example, some of the posts included content that contained antisemitism. Pertinent to differences in reactions, a religion scale or attitudes towards different religions should be made. It is plausible to suggest that individuals who practice Judaism—or sympathize with the religion—could become angrier when facing this type of social media post. Although the present study did not find any significant differences in reactions based on race or political affiliation, replication studies should continue to examine these factors—especially when examining reactions to social media posts. The present study showed social media posts that were racist and more needs to be explored with respect to emotional reactions when using topics such as racism. Future research could examine racial attitudes scales that could help identify factors that could predict emotional reactions to social media posts. With respect to sexual and gender identity, measuring sexual and gender orientation status could also be relevant when examining emotional reactions to social media, as well as attitudes towards LGBT. The present study did not include the use of such scales and cannot make relevant conclusions, but it is plausible that individuals who identifies as LGBT, or support LGBT, may become susceptible to emotional reactivity when viewing images that discriminate against LBGT.

Limitations and future directions

The findings in the present study should be interpreted in light of several limitations. To begin, this study was correlational, and no cause and effect should be presumed. Another limitation is that self-report measures of anger may be susceptible to

social desirability bias and interpretations should be taken lightly. Lastly, it is important to note that responses to anger-inducing events do not play out the same way during research situations. Many factors can influence real-life anger responses and such factors cannot be standardized in research situations. Despite these limitations, the present study highlighted that individual differences in personality relate to the experience of anger induced by social media posts. Given that Gray proposes that emotional systems (e.g., BIS and BAS) have specific neurophysiological underpinnings, future studies could attempt to examine the relationship between BIS/BAS and neural activity with respect to social media anger. Perhaps, biological underpinnings could improve predictors of social media anger experience. It has been suggested that the BAS is associated with more left frontal activity and that this serves as an index of approach-oriented actions (de Pascallis et al., 2013). Since the BAS was associated with social media anger ratings, perhaps neural substrates could better illustrate the biological mechanism of anger facilitation by the BAS in the presence of anger inducing social media. Such results could be in line with Gable and Poole (2014) where it was found that trait approach motivation relates to neuropsychological responses of anger. More specifically, BAS predicted greater left frontal asymmetry to anger pictures (Gable & Poole, 2014).

Conclusions

In conclusion, the current study examined how the BIS and BAS relate to social media anger ratings, anger expression, and anger control. The findings suggest that while the anger ratings could be predicted by levels of the BIS, when controlling for sex, only Anger Control In was a significant predictor. In addition, the relationship between the BIS and BAS to the STAXI-2 (i.e., Trait Anger, Anger Expression Out, Anger

Expression In, Anger Control Out, and Anger Control In) highlighted that the experience and expression of anger is not exclusive to either the BIS or BAS. Rather, it showed that these two systems work independent of emotional states to deliver either inhibition or facilitation regardless of the affective valence. In light of these findings, research examining social media's impact on emotional states—specifically anger—should focus on investigating the potential rewarding experiences of social media use in order to further examine what aspects of social media can promote or inhibit anger experiences in accordance to the BIS/BAS. This will enhance our understanding on how the BIS and BAS can better predict emotional reactions to social media content and promote better mental health.

APPENDIX

14 Social Media Posts with High Factor Loadings, used in the aggregate anger ratings

← Tweet

 **White Lane**
@WhiteLane

I am tired of seeing ghetto ass blacks in college. you can never make something good from trash

11:10 PM · 10/24/19 · [Twitter Web App](#)



 **White Lane**
@WhiteLane

Like Page

"Make America White Again."
That's the message on a sign that has made people in Ord uneasy.  talked to the sign's owner and neighbors.



Ord Community demands action from controversial sign
A few weeks after a controversial sign was placed in a Central 

Like Comment Share

 **White Lane**
@WhiteLane

Unpopular Opinion: You do not need verbal consent to become sexual with them, **fuck** them and enjoy it. Your mama sure like it.

11:10 PM · 10/24/19 · [Twitter Web App](#)

 **White Lane**
@WhiteLane

Following

... a f... g hate n... s, I wish we could put them all in a concentration camp with k... s and be done with the lot

← ↻ ❤️ ...





XXXXXXXXXXXXXXXXXXXX
@XXXXXXXXXXXX



Lets kill jews and kill them for fun
[#killjews](#)

XXXXXXXXXX, XXXXX XXXX



XXXXXXXXXXXXXXXXXXXX
@XXXXXXXXXXXX

Follow

Homosexuality is a disease of the heart and
mind [#MuslimDragQueens](#)



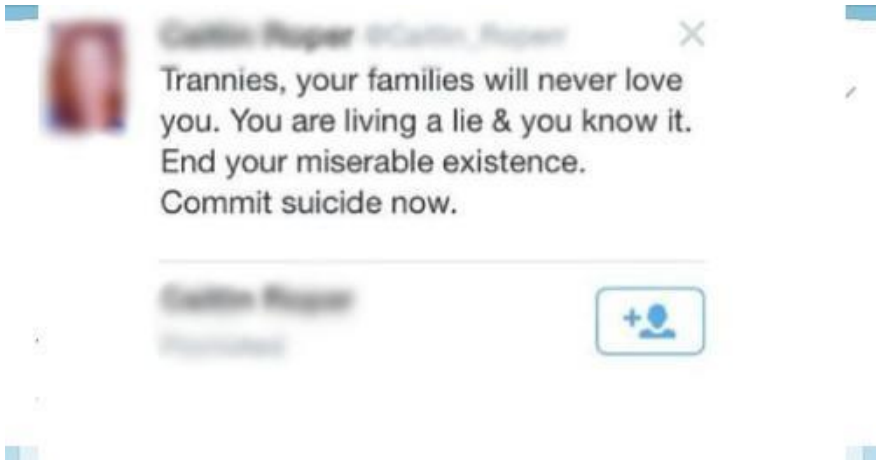
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Follow

[@femfreq](#) kill yourself feminists are a waste of
air also more games should have girl
characters half naked such as "Tomb Raider"
etc



If blacks in this country are so offended no one is forcing them to stay here. Why don't they pack up and move back to Africa where they will have to work for a living. I am sure our government will pay for it! We pay for everything else.

2 hours ago · Like · Reply



White Power
@whitepower

Stop antagonizing them, they are our future! I will fight you if you are against them. [#WhitePower](#)



6:47 PM on Oct 19 · [Twitter Web App](#)



Rebecca Hill
@rebeccahill

The role of a woman should be as defined:

- Cook, clean, have sex with husband
- Raise the kids
- Not argue with husband
- Let husband make decisions
- Be submissive at all times

If all women were like this, the world would be a better place.

6:57 PM on Oct 19 · [Twitter Web App](#)



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