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A grounded theory analysis of the functions of pro-ana social media accounts

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A Grounded Theory Analysis of the Functions of Pro-Ana Social Media Accounts

by

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Abstract

Anorexia nervosa is an extremely dangerous eating disorder whose etiology has recently been examined in relation to difficulties in emotion regulation. The phenomenon of pro-anorexia (pro-ana) on social media sites and websites has also received recent attention; however, the functions served by these pro-ana accounts are not well understood. Thus, the present study aimed to examine the possible functions of these accounts, particularly with regard to emotion regulation, through the use of a Grounded Theory analysis. An emotion expression function was supported in this analysis, in addition to seven other functions: defining anorexia as a lifestyle, identity, or disease; discussion of anorexia as cyclically relapsing and recovering; defining what it means to be thin; defining the self as either fat or thin and thus worthless or good; motivating continued engagement in disordered eating; soliciting positive or negative attention from others; and the importance of images in the service of other functions. These functions of pro-ana social media sites can be used to improve treatment and support for those affected by anorexia nervosa both online and offline.

Keywords: anorexia; social media; pro-ana; emotion regulation; motivation; identity; images

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Introduction

Eating disorders comprise a variety of extreme behaviors characterized by disturbances in food consumption and related behaviors, leading to significantly impaired psychosocial functioning and physical health (American Psychological Association, 2013). Anorexia nervosa is particularly concerning as research has indicated that this disorder has the highest mortality rate of any eating disorder (Franko et al., 2013) and a higher rate than many other mental illnesses (Arcelus, Mitchell, Wales, & Nielsen, 2011). Thus, discovering the etiology of anorexia nervosa and the function of associated behaviors is vital. One theory that has gained support in recent studies suggests that behaviors associated with anorexia nervosa serve to regulate emotions, particularly negative emotions (Espeset, Gulliksen, Nordbø, Skårderud, & Holte, 2012; Fox et al., 2013; Gratz & Roemer, 2004), and research regarding the function of anorectic behaviors is rising. Another recent phenomenon that has received attention both in the media and in research is pro-anorexia websites and social media groups. Research has suggested that individuals use pro-ana for a variety of purposes such as identity formation (Gavin, Rodham, & Poyer, 2008), information seeking (Mulveen & Hepworth, 2006), solicitation of social support (Tong, Heinemann-LaFave, Jeon, Kolodziej-Smith, & Warshay, 2013), and expression of emotions (Juarascio, Shoaib, & Timko, 2010). The popularity of these groups indicates that they are likely serving important functions for those who choose to discuss and express their anorexia on social media sites. However, little research has evaluated the differential functions various social media sites may serve. Further, there is a dearth of research examining anti pro-ana and recovery-oriented social media groups. Examining the functions of social media pro-anorexia groups will allow practitioners and professional groups to replicate these functions in an environment that is safe and medically sound. Thus, this study aims to conduct a grounded

theory analysis of the functions of pro-anorexia accounts on three popular social media sites in order to inform the creation of online clinical resources for those affected by anorexia.

Anorexia Nervosa

The *Diagnostic and Statistical Manual of Mental Disorders Fifth Edition* (DSM5) describes anorexia nervosa as a persistent restriction of energy intake, an intense fear of gaining weight or becoming fat, engagement in behaviors that interfere with gaining weight, and a disturbance in the way weight or shape is perceived (American Psychiatric Association, 2013). Anorexia nervosa is reported to be present in approximately 0.4% of young women (American Psychological Association, 2013). Despite records dating as far back as the 1600s (Ryle, 1939), scientific understandings of the etiology of the disorder and effective treatments for it remain inconclusive. This may be due to the non-specific and often overlapping features of eating disorders and those of other psychopathologies (Gilboa-Schechtman, Avnon, Zubery, & Jeczmien, 2006). As a result, many of the current theories on the etiology of and effective treatments for anorexia have arisen from those applied to related disorders.

Anorexia and Comorbidity

One perspective and related treatment for those affected by anorexia nervosa is offered by cognitive theory. The approach grounded in cognitive theory, cognitive remediation, is predicated on the findings that anorexia nervosa is commonly associated with an inflexible cognitive style (Roberts, Tchanturia, Stahl, Southgate, & Treasure, 2007; Wu et al., 2014). Cognitive remediation primarily addresses individuals' thought processes, rather than the content of thought, through games and puzzles designed to improved meta-cognitive processes (Berg & Wonderlich, 2013). While the role of cognitive inflexibility in anorexia nervosa has been the

basis for this approach to treatment, other theories and treatment approaches have focused on the

association between the symptoms of anorexia and comorbid psychological disorders.

Another option for treatment of anorexia is offered by exposure-based approaches,

originally developed for use with individuals affected by anxiety disorders but recently adapted

for use with anorexia nervosa (Berg & Wonderlich, 2013). Their adaptation for use with

anorexia was conducted due to the common comorbidity of anorexia and anxiety disorders in

both adults and adolescents (Hughes, 2012; Kaye, Bulik, Thorton, Barbarich, & Masters, 2004).

One particular type of exposure-based therapy, exposure and response prevention, suggests that

exposure to feared foods and consumption contexts without the occurrence of avoidance

behaviors will serve to decrease food/eating-related anxiety thereby increasing caloric intake

(Berg & Wonderlich, 2013). Another exposure-based method, mirror image exposure, is

predicated on the association between anorexia and disturbed perceptions of body weight and

shape (American Psychiatric Association, 2013). Some researchers have conceptualized this

body dissatisfaction and body checking as a form of anxious behavior and have suggested that

repeated exposure to one's own body might serve to decrease associated anxiety and

dissatisfaction nervosa (Berg & Wonderlich, 2013).

A third perspective on the treatment of anorexia is provided by dialectical behavior

therapy (DBT). This approach was first developed for the treatment of borderline personality

disorder and suicidality (Berg & Wonderlich, 2013). The primary goal of this treatment is the

reduction of self-harm behaviors (Berg & Wonderlich, 2013). Research has indicated that

individuals affected by anorexia nervosa often demonstrate comorbid self-harm behaviors and

suicidality, in addition to extreme eating and exercise behaviors (Bühren et al., 2014; Swanson,

Crow, Le Grange, Swendsen, & Merikangas, 2011). The objective of DBT is to prevent

maladaptive behavior, such as food restriction or self-injury, through the use of affect regulation skills (Berg & Wonderlich, 2013). Thus, the primary focus of DBT is on deterring or tolerating intense emotions that can lead to engagement in problematic and dangerous behaviors (Berg & Wonderlich, 2013). These approaches to the treatment of anorexia nervosa highlight the association between anorexia and other disorders and symptoms (e.g. anxiety, self-harm); however, recent attention has also been given to the association between anorexia and a broader range of emotion regulation difficulties.

Anorexia and Emotion Regulation

Many theories have been proposed regarding the connection between emotion regulation strategies and anorexia. One influential theory suggesting that disordered eating behaviors function as a form of emotion regulation was created by Gratz and Roemer (2004). Gratz and Roemer (2004) conceptualized emotion regulation as comprising several components: 1) an awareness and understanding of emotions, 2) acceptance of experienced emotions, 3) the facility to control impulsivity and behave in a way that advances goals even when experiencing negative emotions, and finally, 4) the capability to flexibly use emotion modulation strategies that are appropriate to the context. Emotion dysregulation occurs when one or all of these abilities is absent or impaired (Gratz & Roemer, 2004). Many studies have since examined the role of emotion regulation, dysregulation, and individual influence of each component on the symptoms of anorexia nervosa.

Emotion regulation difficulties, as a broad category, have been studied as potential transdiagnostic factors among various types of eating disorders. One study conducted by Gilboa-Schechtman, Avnon, Zurbery, and Jeczmien (2006) examined the role of general emotional distress and the patterns of emotion regulation difficulties, in particular, in anorexia compared to

those in bulimia. Specifically, this research examined whether the presence of anxiety and depression (as indicators of emotional distress) would mediate the relationship between disordered eating and emotional processing. Additionally, the researchers hypothesized that those affected by bulimia would report great emotion regulation difficulties, while those affected by anorexia would report greater difficulties with emotional awareness. Results of this study indicated that none of the differences in emotional awareness or regulation between those with eating disorders and healthy controls remained significant after controlling for depression and anxiety, suggesting that emotional distress did mediate the relationships between eating disorders and emotional processing. Additionally, the results of this study suggested that those affected by anorexia reported higher levels of difficulty in emotional awareness and emotion dysregulation than did participants affected by bulimia. These findings suggest that emotional distress (as indicated by comorbid anxiety and/or depression) plays a vital role in eating disordered behavior. The results further suggest that those individuals affected by anorexia may experience greater levels of emotion awareness and regulation difficulties compared to those affected by bulimia.

Brockmeyer et al. (2014) further examined emotion dysregulation as a transdiagnostic factor among subtypes of eating disorder diagnoses. Participants diagnosed with bulimia, binge eating disorder, anorexia restricting subtype, and anorexia binge-purge subtype were included in the experiment. Specifically, the researchers aimed to investigate the similarities in emotion regulation difficulties across eating disorders diagnoses, whether those participants affected by a bulimic-type eating disorder (bulimia and anorexia binge-purge subtype) would endorse more impulse control difficulties than those affected by a restricting-type eating disorder and whether the two subtypes of anorexia can be reasonably treated as one group in analyses or would be more appropriately differentiated for analysis. The results of this examination revealed that, with

the exception of impulse control, participants affected by both subtypes of anorexia and bulimia did not differ in scores in emotion regulation difficulties. Results further indicated that participants affected by anorexia binge-purge, but not those diagnosed with bulimia or binge eating disorder, reported significantly more problems with the impulse control aspect of emotion regulation. The two subtypes of anorexia did not differ significantly on any other aspect of emotion regulation, however, suggesting that it is appropriate to group both anorexia restricting subtype and anorexia binge-purge subtype together in analyses. Thus, this study provides additional evidence for the role of emotion regulation difficulties across eating disorder diagnoses and begins to examine the specific aspects of emotion regulation difficulties that may be experienced by individuals who engage in particular patterns of disordered eating behaviors. Additionally, these findings provide evidence of impairment in emotion regulation in those affected by anorexia but do not indicate whether these differences result from the effects of starvation or whether they improve once the individual returns to a normal weight.

This issue was addressed by Haynos et al. (2014), who compared emotion regulation difficulties in individuals at various stages of recovering from anorexia. The results of their analysis indicate that clinical variables, such as BMI and eating and mood disorder symptoms, improved following restoration of normal weight. However, no clinically or statistically significant improvements in emotion regulation were observed after patients had returned to normal weight (Haynos et al., 2014). This finding suggests that the emotion dysregulation experienced by individuals affected by anorexia is not a result of starvation and is likely to persist despite the restoration of normal weight if emotion regulation is not a primary component of treatment.

However, these findings raise further questions regarding the specific aspects of emotion regulation that may be most beneficial to target in treating anorexia. The specific roles of various facets of emotion regulation and related concepts have continued to gain attention in research. A study conducted by Harrison, Sullivan, Tchanturia, and Treasure (2009) examined the relative contribution of emotion recognition difficulties and emotion regulation difficulties in the symptoms of anorexia. Emotion recognition referred to the individual's ability to distinguish emotions accurately in the faces of others, while emotion regulation referred to the individual's capacity to manage emotions in the self and tolerate emotions in others (Harrsion et al., 2009). The results of this study confirmed that those affected by anorexia demonstrate deficits both in emotion recognition and in the regulation of emotions. These results provide evidence that individuals affected by anorexia experience difficulties in at least two aspects of emotion regulation.

Another study conducted by Racine and Wildes (2013) examined the unique role of the different facets of emotion regulation and their relationship to specific eating disorder symptoms. This study explored the four facets of Gratz and Roemer's (2004) model of emotion regulation in relation to BMI, eating disorder cognitions, objective and subjective binge episodes, and purging episodes (Racine & Wildes, 2013). The findings of this study revealed that eating disorder cognitions were associated with difficulties in emotion understanding and acceptance and were significantly predicted by problems with emotional awareness. The only aspect of emotion dysregulation that was significantly associated with either form of bingeing and purging was difficulty resisting impulsive behavior when upset. These findings provide evidence that particular aspects of the emotion regulation process may be associated with specific eating disorder behavior in anorexia.

In addition to work examining the role of each aspect of emotion regulation in anorexia nervosa, research attention has also been devoted to exploring regulation of particular emotions through eating disorder symptoms. One such study was conducted by Fox et al. (2013), who investigated the coupling of anger and disgust in relation to emotion regulation difficulties in anorexia nervosa. The authors provided this description of the process of emotion coupling between anger and disgust in anorexia: "losing weight is often seen as a means to be more… likeable and to feel more in control, and the parallel processes of emotion suppression and weight loss become connected over time. Thus,… the suppression of anger in [anorexia] becomes 'coupled' with the emotion of disgust" (Fox et al., 2013, p. 321). The results of this study indicated that levels of disgust increased significantly following an anger-induction task in participants affected by anorexia, but this effect was not observed in the healthy control group (Fox et al., 2013). Further, levels of both anger and disgust were correlated with participant's estimations of body size (Fox et al., 2013). The findings of this study provide evidence that eating disorder symptoms can be used to regulate the specific negative emotions of anger and disgust.

Other negative emotions have also been examined in relation to emotion regulation through engagement in disordered eating behaviors. Espeset et al. (2012) conducted a grounded theory analysis of interviews with 14 female patients in recovery from anorexia nervosa. The study aimed to explore how these women managed their negative emotions and how they viewed the relationship between their emotions and the symptoms of their eating disorders. In this study's analysis, sadness was reported to be regulated through avoiding awareness of or situations in which it might be experienced, inhibiting the expression of sadness, and suppressing the intensity of sadness. Sadness was reported to be avoided by changing focus onto body

weight/shape or food, inhibited by masking their sadness, and suppressed by restrictive eating and/or purging. Anger was avoided by engaging in restriction or purging, or re-focusing on food or body weight/shape rather than on the emotion. Anger was also associated with inhibition via physical activity and with channeling out the emotions through self-control, self-harm, and/or exercising. The emotion of disgust was associated with avoidance through avoiding food and body awareness, and food restriction or purging behaviors. Finally, fear was associated with suppression through food restriction, body checking behaviors, and purging. The results of this study provide evidence suggesting that a wide variety of negative emotions are associated with problematic emotion regulation strategies used and disordered eating behaviors engaged in by individuals with anorexia.

Although it has not received as much attention as negative emotion regulation, the role of positive emotion in anorexia has also been explored. One recent study examining the role of positive emotion differentiation in weight loss behaviors in anorexia was conducted by Selby et al. (2014). Positive emotion differentiation is defined as the ability to discriminate separate positive emotions (Selby et al., 2014). Ecological Momentary Assessment (EMA) data was collected from a sample of 118 women who met criteria for anorexia or subclinical anorexia. The results of this study indicated that low ability to differentiate between positive emotions and increased intensity of positive emotions predicted more frequent engagement in laxative use, vomiting, physical exercise, self-weighing, body checking, and dietary restriction. Additionally, those who experienced low positive emotion differentiation and engaged in more weight loss behaviors were found to experience elevated levels of positive emotion after engaging in maladaptive weight loss behaviors. These results suggest that although negative emotion

regulation plays a significant role in anorexia, regulation and experience of positive emotion may also serve a vital role in motivating and reinforcing maladaptive behaviors in anorexia.

This research demonstrates that understanding the function of eating disordered behaviors, particularly in relation to emotion regulation, will be vital in creating effective treatments for individuals who are affected by eating disorder, particularly anorexia. However, individuals displaying symptoms of anorexia are unlikely to actively seek treatment, especially psychological treatment, for their symptoms (Cachelin, Striegel-Moore, & Regan, 2006). Studies have suggested this may be due to a perception, especially among young people, that anorectic behaviors are not severe enough to warrant intervention from health care professionals (Meyer, 2001). One factor in this perception of anorexia among young people may be related to views that are expressed online regarding eating, weight, and shape.

Pro-Ana Websites

In recent years the phenomena of pro-anorexia, or pro-ana, websites and blogs has gained attention both in the media and in research. Websites that are identified as pro-ana often supply information regarding techniques for achieving extreme weight loss and express support for extreme eating and weight loss behaviors. Thus, the authors of pro-ana websites and blogs often do not view extreme eating behaviors as problematic. One study conducted by Strife and Rickard (2011) examined the unique ways in which pro-ana website authors conceptualized anorexia nervosa. This study inspected the mission statements of 14 pro-ana websites using a constant comparative analysis in order to gain an understanding of the ways in which these authors understood anorexia nervosa and the extreme eating patterns associated with it. Two distinct viewpoints emerged from their analysis: understanding of anorexia as a medical concern and understanding anorexia as a personal lifestyle choice. Of the 14 websites studied, 8 authors

expressed an understanding of anorexia as a medical illness or disorder. However, it is

interesting to note, that even when authors recognized anorexia as a medical concern, many still

reported that they themselves were not attempting to recover. The remaining six authors in the

analysis made statements indicating that they viewed anorexia and/or extreme weight control and

food restriction as a choice and as a particular way of leading one's own life, rather than as a

disease that needs to be avoided or recovered from. Another important distinction between those

authors who viewed anorexia nervosa as an illness and those who viewed it as a lifestyle was

their use of particular language. Those authors who expressed the view that anorexia is a lifestyle

choice used more language emphasizing control and power, indicating that those who make the

choice to take control over their body and the food they put into it are truly strong and have

complete control over their lives. Conversely, authors who viewed anorexia as a disorder or

illness more often used passive and self-defeating language. These authors were also more likely

to endorse a "more deterministic approach that minimized the concept of free will" (Strife &

Rickard, 2011, p. 215). These authors viewed anorexia as a daunting opponent over which they

themselves have no control (Strife & Rickard, 2011). This study illuminates the distinct ways in

which pro-ana website authors view anorexia nervosa. In addition, this study highlights the

importance of attending to the particular language used by pro-ana authors in describing

anorexia. The use of particular types or styles of language may provide assistance in gaining a

more complex understanding of the ways in which authors view anorexia beyond the surface

value of the words they use.

    Wolf, Theis, and Kordy conducted a study that examined the nuances of language used in

pro-anorexia blogs with the aim of distinguishing between the subtleties of language used by

those who were actively engaged in disordered eating behaviors from those who were actively in

recovery. This study examined language use in pro-ana, recovery (maintained by an individual in the process of recovering from an eating disorder), and control blogs (total N=87) across four dimensions commonly affected in anorexia nervosa: behavior, affect, cognition, and social dimensions. The results of their analysis revealed that pro-ana blog authors used more language suggesting close-mindedness, preoccupation with food, dieting, and eating and less social connectedness than authors of recovery-oriented and control blogs. Additionally, pro-ana bloggers used less language indicating insight and abstraction than recovery bloggers. Interestingly, pro-ana bloggers were found to use fewer words suggesting negative emotional experiences (sadness and anxiety, in particular) than authors of recovery blogs, although this was not the case for control blogs. The authors suggested this difference may be due to the enhanced ability and motivation of those in recovery to label and describe their emotional states (Wolf et al., 2013). While language use is one feature of pro-ana blogs and websites that can provide insight into the cognition, behavior, and emotion of those who author them, there are also broader features of these sites which are important to furthering an understanding of the pro-ana and pro-eating disorders community.

In addition to the particular language used by pro-ana websites and blogs, the inclusion of common overall sections and themes has also received attention from researchers in order to improve understanding of the types of information provided by pro-ana sites. Norris, Boydell, Pinhas, and Katzman (2006) examined variables related to the authors of pro-ana websites (e.g., sex, age), the content of these websites, and their common over all themes. The researchers located 12 pro-ana websites using Google and used grounded theory to examine the content and themes of the websites. Of the 12 website authors, 8 contained personal information about the creator of the site. All of the creators were female, four were under the age of 18, comorbid

depression was described by 4 authors, and past suicide attempts and self-harm were reported by

2 authors. Only one author endorsed the view of pro-ana as a lifestyle choice, while almost half

of the authors indicated that they wanted their sites to provide a source of support for individuals

affected by eating disorders. Broad categories of information available on the websites were also

analyzed. This analysis indicated that 11 of the 12 sites examined contained "thinspiration"

content. This type of content was primarily images but also included motivational quotes and

writings. A "tips and tricks" section was included on 67% of the sites. These sections principally

dealt with providing suggestions for others regarding how to lose weight most efficiently, though

often not safely. Additionally, these sections often included tricks aimed at hiding extreme

weight loss and dieting from loved ones and medical professionals. Finally, more than half of the

sites contained body mass index (BMI), basal metabolic rate (BMR), and calories burned per

activity calculators. The researchers also analyzed the themes common to the pro-ana sites. This

analysis indicated that the three most common themes were control, perfection, and strength.

These themes were presented through the use of religious metaphors (e.g., Ana Psalm or Creed)

in more than three quarters of the sites examined (Norris et al., 2006). A description of the

themes present in the sites provides some information about the purpose of such sites; however,

an investigation into the purpose of such sites is also vital.

     Another study, conducted by Mulveen and Hepworth (2006), examined the common

themes and categories present in pro-ana websites, and their relationship to the possible functions

of participation in these websites. The researchers examined 15 separate message threads

(discussions from several authors) from one pro-ana internet site in order to explore the purpose

of participation in several categories of discussion on the site. Using an interpretive

phenomenological analysis to examine the data, four themes emerged from the discussion

threads: tips and techniques, "ana" as distinct from anorexia nervosa, social support, and a need

for anorexia. The tips and techniques featured information related to special fasting techniques

and dietary restriction, calorie counting, and exercise routines. Accompanying many posts

regarding tips and techniques were expressions of emotions related to the extreme dieting and

weight loss practices described in the posts. Specifically, emotions and emotion management

accompanying information often related to the emotions experienced by the poster while

engaging in the fasting or exercise behaviors.   The second theme, "ana" as distinct from

anorexia nervosa, differentiated those who viewed their practices as part of a medical illness

("anorexia") or as a lifestyle choice ("ana"). Many members of the site identified with "ana" as a

lifestyle choice; this identification emphasized being in control, aware, and making a conscious

choice to engage in extreme dieting and weight loss. Some members of the community had been

previously diagnosed with an eating disorder and often made use of the online community as a

means to slow or terminate their recovery, while maintaining their low body weight. Often,

users' ultimate reasons for joining and being active in the pro-ana community reflected high

levels of emotion dysregulation (Mulveen & Hepworth, 2006).

The third identified theme of seeking social support begins to approach a possible

function of participation in the pro-ana site. Users often emphasized using the pro-ana

community as a source of social and emotional support (Mulveen & Hepworth, 2006). Website

participants endorsed views of the group as a safe place to discuss their eating disorders.

Interestingly, the site's users provided support both for extreme dieting and weight loss

behaviors and for participants who chose to move toward recovery. Recovery was usually met

with community support when the users reported that they were slipping to dangerously low

weights or into more extreme patterns of disordered eating. However, users also indicated that

they viewed the pro-ana website community as a place where they did not have to hide their

fasting and exercising habits for fear of being judged or forced into recovery if they were not

ready to give up their lifestyle. The final category that emerged from the analysis was expressing

a need for anorexia. Often, if users were confronted with the prospect of recovery before they

were prepared to make that change, many cited the cultural desirability of having a thin figure as

a factor that motivated them to continue their weight loss. Additionally, the user would

frequently indicate a need for anorexia to cope with emotional pressures and stress (Mulveen &

Hepworth, 2006). These themes indicate that those who make use of pro-ana websites use them

to share information, solicit social support both for extreme eating practices and for recovery, to

express and regulate their emotional states, and to discuss their conceptualizations of "ana" as a

lifestyle rather than an illness.

Gavin, Rodham, and Poyer (2008) also examined the ways in which users on a pro-ana

discussion forum conceptualized their anorexia and solicited social support from the community.

Postings from 70 different authors on one pro-ana discussion forum were used in the analysis.

Interestingly, these users had a much wider age range than that reported in other studies (Norris

et al., 2006), with authors ranging in age from their teens to their 50s and 60s (Gavin et al.,

2008). The authors of posts to the forum made use of social support through expressions of

desire for and achievement of the goal of increased weight loss. Within this context, common

signs and symptoms of severe weight loss (e.g., hair loss, lanugo) that accompany anorexia were

reframed as indicators of success or "doing anorexia right" (Gavin et al., 2008, p. 328). Identity

formation within this community was also very important in discussions. Two themes were

prominent with respect to identity, maintaining a sense of the pro-ana self as abnormal and

hiding pro-ana identities from those outside the community. A sense of the pro-ana self as

abnormal is not used as a derogatory in the pro-ana community, rather it refers to abnormal in the sense of having extreme control over their thoughts and behaviors and supports their choice to pursue the ana lifestyle. This controlled, abnormal self is further supported by clear discussions of those outside the community as "other" and as incapable of understanding the choice to be pro-ana. Thus, those in the pro-ana community are encouraged to hide their eating disordered behavior and identities from the "others" who may not understand their lifestyle choice. The pro-ana community is seen as the only place where users can safely express their identities without fear of interference or forced recovery from those outside the community. Of interest, Gavin et al. also found that users often expressed feeling that they were unworthy of posting to the forum, making statements that devalued themselves or their physical characteristics. These posts often elicited reassurance from the community and affirmations of the posters worthiness of a pro-ana identity. Thus, users' feelings are validated as normal within the pro-ana community and a sense of normal identity as a part of the community is strengthened (Gavin et al., 2008). Online discussion forums represent an arena for the formation of a group identity as pro-ana and personal identities within that community can also be formed online.

Formation of identity within the pro-ana community can also be expressed through the style of communication and social support offered by the individual user. A study conducted by Haas, Irr, Jennings, and Wagner (2010) examined 1,200 posts from several online blogs and websites to gain an understanding of users individual identities within the pro-ana community. A grounded theory analysis was used to generate three types of identities within the pro-ana community (Haas et al., 2010). These identities are primarily expressed through the particular types of self-disclosures made by individuals on the pro-ana site. The first type identified in the analysis is the self-loathing ana. This type of disclosure involved expression of loathing either

for the user's physical appearance or her inner being. Expressions of loathing focusing on the

physical body often indicated unhappiness with their body shape and/or weight because it did not

match an ideal thin body type. Additionally, users often expressed experiencing their inner selves

as weak and worthless. Often these disclosures were accepted as valid by others in the

community and were often met with support in the form of encouragement and advice on how to

lose more weight. The second type of identity disclosure was that of an advising ana. Users who

often made these types of disclosures posted primarily advice on dieting or exercise and on how

to deal with social situations outside of the pro-ana community. Specifically, advising anas

provided strategies for quick weight loss and for dealing with situations in which pro-ana

community members are forced to eat by those close to them. The final type of identity

disclosure is group ana encouragement. Since "adherence to the pro-anorexia lifestyle demands

strict self-discipline" community members often use posts to encourage themselves and other to

continue the pro-ana lifestyle. Encouragement was provided often in the form of reassurance that

even if others were not at their ideal weight they could persevere in their extreme dieting to

achieve their goals. Postings expressing generalized affection for everyone in the online pro-ana

community were also commonly used forms of encouragement (Haas et al., 2010). All these

identities relate to the formation of a strong social bond between group members.

Use of the pro-ana sites for social support is also a common theme. A study conducted by

Tong, Heinemann-LaFave, Jeon, Kolodziej-Smith, and Warshay (2013) examined posts on 48

pro-ana blogs to describe the nature of social support being offered online. The results of Tong et

al.'s (2013) content analysis suggested that several forms of support were prevalent on pro-ana

blogs. Information support usually included messages providing facts or advice often related to

exercise and dieting and accounted for 11.2% of the comments in the sample. Tangible support,

offers to help or complete a direct task in response to another user's request, were present but

rare occurring in 1.6% of the sample. Networking support was also offered; this category

involved providing connections between specific users or blogs with similar topics or interests,

although this was also very rare occurring in only 0.5% of comments. Esteem support, comments

that strengthened the user's self-esteem through compliments or validation, were more common

among the blog users and were found in 14.4% of comments. Reciprocal self-disclosures

regarding shared experiences with anorexia occurred in 26.3% of posts. The final type of social

support coded was emotional support. Emotional support messages were those that "conveyed

encouragement, sympathy, or a general understanding of a blogger's behavior, relationships, or

life circumstances" (Tong et al., 2013, p. 416). This type of support was the most frequent,

occurring in 41.7% of comments, and usually centered on encouraging extreme weight loss

behaviors (Tong et al., 2013).

These studies indicate that pro-ana online spaces are important in the development and

maintenance of pro-ana identity, and provide several forms of support for users who visit these

sites. However, websites and journal-like blogs are no longer the only option for interaction and

expression online.

Social Media

Social networks or social media began to rise in popularity with the advent of Facebook

in 2004 (http://newsroom.fb.com/company-info/). Facebook allowed users to connect with one

another in a way that had not been possible through previous websites, specifically through the

ability to personalize and interact with others. Soon after Facebook gained immense popularity

with younger internet users, other sites with similar functions began to arise. These sites are

collectively known as social media sites. Social media sites differ from traditional websites in

that the former allow users to create a personal and individual web-space for themselves. Each

account is unique to the individual who owns it. Social media sites are also unlike traditional

websites because they allow users, through their personalized accounts, to view the unique

content of other users and to interact with that content. In many ways, social media sites are a

continuation of users' offline social interactions. Importantly, the creation of individualized web-

spaces does not require complex coding or computer knowledge, as the generation of a full

websites does. This makes social media sites accessible to the average internet user. Social

media accounts are also free to create and administrate. Acquiring a traditional website space (or

URL) often incurs a cost to the creator of that space, thus limiting the accessibility of this type of

media space for self-expression.

Although Facebook has received significant attention in research as a model social media

site, there are many other options for participating in social media. The three sites that will be

examined in the current research are Tumblr, Twitter, and Instagram.

Tumblr. Tumblr is a social media platform in which each user maintains a blog. These

blogs allow the user to post media content such as, text, photos, links, videos, and music

(https://www.Tumblr.com/about). This site reports 298.8 million individual blogs (on June 7,

2016, https://www.Tumblr.com/about). The total number of posts reported to be present on a

Tumblr based blog currently rests at 135 billion, with 86.8 million posts being made daily (on

June 7, 2016, https://www.Tumblr.com/about). Tumblr currently ranks at number 22 among all

websites visited in the United States, according to an alexa traffic rank

(http://www.alexa.com/topsites/countries/US). According to *Business Insider*, 46% of Tumblr

users were between the ages of 16 and 24 years old (Smith, 2013). Additionally, Tumblr was

ranked as the seventh largest social media platform globally (Ballve, 2013).

Most Tumblr users choose to operate their blogs under usernames, that are not associated with their identities. Blogs often have a theme that relates to the interests of the individual user. Blog posts can be text-based, include photos, videos, or music, and include links to web content outside of the Tumblr site. Users have the option to either post original content to their blogs or link content posted by other users to their site (i.e., "Reblog" the content). This feature distinguishes Tumblr from other blog sites because it allows users to quickly and easily share content from other blogs with their own followers.

Twitter. Twitter is another popular form of social media. Through their Twitter accounts users are able to post updates or Tweets. Tweets are "an expression of a moment or idea. [they] can contain text, photos, and videos" (https://about.twitter.com/what-is-twitter/story-of-a-tweet). Twitter reports having 310 million active users, making 500 million posts per day (https://about.twitter.com/company). Twitter's ranking among the top websites in the United States is currently eighth (http://www.alexa.com/topsites/countries/US). According to the Pew Research Center, the largest age range of those using Twitter are between 18 and 29 years old (http://www.pewinternet.org/2015/01/09/demographics-of-key-social-networking-platforms-2/).

Text-based Tweets are limited to 140 characters per Tweet, and photos or videos may be uploaded to accompany each Tweet. This character limit distinguishes Twitter from other social media platforms by limiting the amount of information each user can share at one time. Individuals usually maintain Twitter accounts that are associated with their offline identities, rather than using anonymous usernames. Twitter accounts generally do not have a theme, as they are intended to reflect the individual's life; however some accounts do relate to a particular topic.

Instagram. Instagram is the third social media platform from which data for this study will be gathered. According to the company's website, "Instagram is a fun and quirky way to

share your life with friends through a series of pictures… We're building Instagram to allow you

to experience moments in your friends' lives through pictures as they happen. We imagine a

world more connected through photos" (http://instagram.com/about/faq/). This site is also unique

because it began as a primarily mobile-based form of social media. Accessing the site via the

computer was made possible after the creation of the Instagram app for Android and iPhone

devices. Posts made on Instagram are primarily photos; however, these photos are often

accompanied by descriptive text. Unlike Twitter, Instagram does not place a limit on the number

of characters that can be used in a post. Instagram has approximately 400 million monthly active

users sharing 80 million photos per day (http://instagram.com/press). Instagram ranks at 18th

amongst websites most commonly visited in the United States

(http://www.alexa.com/siteinfo/instagram.com). According to the Pew Research Center, 53% of

Instagram's users are between 18 and 29 years old

(http://www.pewinternet.org/2015/01/09/demographics-of-key-social-networking-platforms-2/).

Instagram users, like Twitter users, commonly create accounts that are associated with

their offline identities. This site is unique because the primary medium for posting is through

photographs, rather than through text. Although text descriptions of photos often accompany

Instagram posts, it is not necessary to include text. When other users respond to posted photos,

comments may only be made through text.

Once accounts on these social media platforms have been created, there are a variety of

modalities through which users can engage with one another.

Communication on Social Media

Within social media sites there are unique ways for individuals to interact with each

other. One form of interaction that is common to most, if not all, social media sites is

commenting or replying. "Commenting" occurs when one individual creates an individualized

reply to or opinion on the post presented by another user. Comments remain associated with the

individual who posted the original content and are not directly linked to the main page of the

commenters account. In some instances, comments can be made available for the commenter's

followers to read; however, this setting can be manipulated by the individual user.

Another interaction modality that is common to the three social media sites that will be

used in this study is the use of hashtags. A hashtag uses the pound symbol, "#", with the addition

of a word or phrase (#feelinghappy, #puppies, or #proana are all examples of common hashtags).

Hashtags represent a system for categorizing similar posts into readily searchable terms. Entering

a particular hashtag into the social media site's search bar will generate a page containing all

posts by all users (provided their account settings allow public access to their content) related to

that topic. For example, if an Instagram user was interested in finding posts related to landscapes,

the user would simply enter "#landscapes" into Instagram's search bar. A page displaying all

posts with the hashtag landscapes would then appear. In order to facilitate the location of their

posts, users will also associate particular hashtags with their content. For example, a Twitter user

who is creating a tweet about women's rights might attach the phrase "#feminism" to her tweet.

By associating her content with this hashtag she has made it easier for like-minded others to

locate her tweet. Searching for particular hashtags is also a way for users to locate others with

similar interests and often leads to following of those accounts. Thus, hashtags are also useful for

expanding each individual's social network rather than simply being used to locate information.

Each social media site also has unique ways for individuals to interact with one another

on that particular site. However, sites also exercise control over the types of content that are

permissible on the platform. Many social media sites maintain policies specifically pertaining to

the use of their site for the promotion of self-harm and/or eating disorders. The interaction

modalities and policies on permissible content of the three sites that will be used in the present

study are detailed below.

Tumblr. Interacting on Tumblr has several distinctive features. When engaging with

others on Tumblr one option is to "like" (indicated by a small heart shaped icon) a post. Liking a

post adds to the number of "notes" (a combined count of likes and reblogs that particular post

has received) associated with that post. Posts that have been liked are stored on the individual's

Tumblr account and can be accessed by the individual for later viewing. However, liking a post

does not directly link that post to the individual's account, and the content is not shared with the

individual's followers. If a user is interested in associating another user's post with her/his

account and making that content accessible to her/his followers, Tumblr allows the user to

"reblog" that content (indicated by the symbol ⇄). When one user's content is reblogged, it

becomes a part of blogger's main page. Through reblogging posts from one user become part of

the online identity of another user, and the content is shared with all the followers of that

individual.

Policy on self-harm and eating disorders related content. Tumblr maintains a strict

policy regarding the media that users are allowed to post with respect to the promotion or

glorification of self-harm related content this policy states:

> Don't post content that actively promotes or glorifies self-harm. This includes content that
>
> urges or encourages others to: cut or injure themselves; embrace anorexia, bulimia, or
>
> other eating disorders; or commit suicide rather than, e.g., seeking counseling or
>
> treatment, or joining together in supportive conversation with those suffering or
>
> recovering from depression or other conditions. Dialogue about these behaviors is

incredibly important and online communities can be extraordinarily helpful to people

struggling with these difficult conditions. We aim for Tumblr to be a place that facilitates

awareness, support and recovery, and we will remove only those posts or blogs that cross

the line into active promotion or glorification of self-harm. (Tumblr, 2015)

This policy suggests that users who encourage others to engage in self-harm or eating disordered

behavior will be removed from the Tumblr community. However, the policy does not prohibit

the posting of eating disorder-related content for other purposes, such as private use. This policy

on encouraging others versus private use of content has led many users to post disclaimer

statements or "Trigger Warnings" on their personal account pages. These statements generally

indicate that the blog does not promote eating disorders; however, triggering content may be

posted by the account holder for personal use. Despite these statements eschewing promotion of

eating disorders, many posts contain hashtags, such as pro-ana, which suggest that the user does,

in fact, promote disordered eating behaviors. Tumblr does not restrict others from following or

viewing these pages or restrict users from posting with hashtags supporting disordered eating

behaviors.

   Twitter. Like Tumblr, Twitter has several unique modalities through which users can

interact. First, Twitter users can "favorite" (indicated by a star symbol) another users tweet.

Favoriting a tweet is conceptually similar to liking a post on Tumblr. When a tweet is favorited,

it is also stored to the users account for later viewing. The second distinctive interaction modality

available to Twitter users is the retweet. Similar to reblogging on Tumblr, when one user

retweets anther users tweet, that content becomes associated with the other user's account and

can be viewed by that users followers. This feature is often used to pass along information to the

followers of the retweeting user (https://support.twitter.com/articles/166337-the-twitter-glossary).

Twitter does not provide an official policy regarding the posting of self-harm or eating disorders related content.

Instagram. Similar to Twitter and Tumblr, Instagram allows users to "like" the posts of other users and store the posts to individual accounts. Liking posts on Instagram is also only for private viewing by the account holder. The other option for interacting on Instagram is through "Reposting" content. This allows users to generate a copy of a post by someone that user follows and share that content with their own followers.

Policy on self-harm and eating disorders related content. Similar to the policy endorsed by Tumblr, Instagram maintains a statement on its Community Guidelines page regarding the promotion or glorification of self-harm which states:

> While Instagram is a place where people can share their lives with others through
> photographs and videos, any account found encouraging or urging users to embrace
> anorexia, bulimia, or other eating disorders; or to cut, harm themselves, or commit
> suicide will result in a disabled account without warning. We believe that communication
> regarding these behaviors in order to create awareness, come together for support and to
> facilitate recovery is important, but that Instagram is not the place for active promotion or
> glorification of self-harm. (Instagram, 2015)

This policy, like that provided by Tumblr, does not prohibit or remove content that is indicated to be used only for the individual account holder's benefit. Again, "trigger warnings" are common among Instagram accounts regularly posting eating disorder-related content. Alternatively, some accounts simply request that other users who stumble upon their account simply block the

account, rather than reporting it for removal. Similar to Tumblr accounts, many users who post

trigger warnings indicating the account holder does not support eating disorders make use of

hashtags such as "pro-ana" on their media content. Instagram does not have a policy restricting

the use of these hashtags.

Pro-Ana on Social Media

Given the freely accessible nature of social media accounts and the wide variety of

options for self-expression and interaction with others, it is not surprising that pro-ana accounts

and groups have emerged on social media platforms, despite many sites' efforts to prevent the

use of social media for the promotion of dangerous habits. Few studies have examined pro-ana

groups as they function on social media, rather than on stand-alone websites or blogs. One study

that has examined social media was conducted by Juarascio, Shoaib, and Timko (2010). This

study aimed to explore the prevalence and content of pro-ana groups on the social networking

sites Myspace and Facebook. Prevalence of pro-ana groups was determined by entering several

related terms into each site's search bar. The results of these searches revealed up to 421 groups

in existence on Myspace and over 500 groups on Facebook. From these groups, 14 were chosen

from Myspace and 12 from Facebook to be included in further content analysis. Results of the

content analysis suggested two broad themes: social support and eating disorder specific content.

Comments that were coded within the social support theme were "characterized by emotional

distress and the need to social connection and support" (Juarascio et al., 2010, p. 398). Emotions

such as loneliness, isolation, sadness, and confusion were commonly expressed by users seeking

support from others in the group. Interestingly, users seeking tips on how to maintain extreme

eating behaviors on Myspace were often met with negative reactions from other users. When a

request for information or tips on successful starvation appeared on the site, other users

commonly expressed anger, annoyance, or hostility toward the requester. Eating disorder specific

content (in which disordered eating behaviors were the primary focus of discussion) was more

often found on Facebook than on Myspace groups. Some eating disorder specific content

intersected with solicitation of emotional support. In these cases, particularly on Myspace, users'

statements of eating disorder specific emotions were often responded to more negatively than

emotional content that was not related to eating. Finally, results of a comparison between content

on Myspace and Facebook with content commonly found on pro-ana websites suggested that

social networking sites differed from websites in at least two important ways. First, social

networks were less likely to have the type of eating disorder specific content that is common on

websites, such as "tip and tricks" sections, thin commandments, or ana creeds. Second, social

network groups contained more emotional content that was deeper and more varied than that

found on pro-ana websites. This difference may be due to the general function of websites as

centers for the exchange of information, as opposed to the function of social media as a place for

interpersonal interactions (Juarascio et al., 2010).

Teufel et al. (2013) further investigated social media in relation to eating disorders. These

researchers aimed to describe and compare pro-ana, anti pro-ana, and recovery-oriented groups

on the social networking site, Facebook, across social support and motivation domains (2013).

Social support was examined both via comments, as has been done in studies examining

websites (Gavin et al., 2008; Haas et al., 2010; Mulveen & Hepworth, 2006; Tong et al., 2013),

and via "likes" on each post ("likes" as described above; Teufel et al., 2013). Motivation with

words and motivation with pictures were also examined within each type of group. Results of the

analysis indicated that motivation through words or phrases was common to all group types, with

recovery-oriented groups having the highest occurrence of motivation through words. Motivation

through pictures, particularly of underweighted individuals, was most prominent in pro-ana

Facebook groups and occurred only rarely in anti pro-ana and recovery groups. Social support, as

measured by number of likes and comments, was found to be highest on pro-ana sites for tips

and tricks related to extreme dieting and exercise. Pro-ana groups were also found to have much

higher engagement and activity rates than both recovery and anti pro-ana sites. Posts on pro-ana

sites were likely to have posts made within the last 24 hours, while recovery and anti pro-ana

groups' most recent posts were made more than 3 months ago (Teufel et al., 2013). This study

demonstrates that social media sites allow users to offer social support and motivate one another

in ways that were not available on websites or blogs. Through social media, users can

communicate through images, words, or a combination of the two and can offer support to one

another through modalities other than long responses to a post. Additionally, this study suggests

that pro-ana sites are more active than recovery-oriented or anti pro-ana sites.

    While these studies suggest that the internet is a place where individuals with eating

disorders can come together to form identities, solicit emotional support, and gain information,

the nebulous nature of the internet means that new networks and new ways of interacting are

emerging frequently. Social networking sites such as Myspace and Facebook are losing

popularity among young people who are more likely to use social networks related to pro-ana

(Hampton, Goulet, Rainie, & Purcell, 2011). New social media sites offer expanded ways to

communicate and interact with others; thus, it is possible that not all social media sites provide

the same content or serve the same functions for those who make use of them. A continuing

scientific exploration of these functions and content is vital to advance scientific understanding

of the phenomena of pro-ana. Additionally, the use of online groups to examine variables related

to disordered eating behaviors offers access to a population engaging in detrimental behaviors,

but who are not currently presenting for treatment. The DSM5 indicates the 12-month prevalence

for anorexia nervosa at 0.4% (American Psychiatric Association, 2013). However, rates among

the general population are difficult to estimate, as those affected by anorexia nervosa often deny

or conceal their behaviors and rarely seek treatment (Smink, van Hoeken, & Hoek, 2012). Thus,

it is vital to continue to advance the scientific understanding of the phenomena of pro-ana as it

develops on new social media platforms.

Study Aims

The present study aimed to identify and describe the potential functions of pro-ana

accounts on three currently popular social media sites (Instagram, Tumblr, and Twitter). Through

identifying the functions that pro-ana accounts serve, it may be possible to integrate aspects that

benefit the individuals who make use of them into accounts maintained by mental health

agencies, and improve current treatment options for anorexia offline, while identifying and

removing aspects that may function to maintain or support disordered eating behavior.

Additionally, the identification of factors that make pro-ana accounts more active than pro-

recovery accounts may assist in making pro-recovery accounts more relevant to the individuals

who need them.

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Method

</div>

Sample

Analyses were conducted using data from three social media websites (Instagram,

Tumblr, and Twitter). These sites were chosen for their large and diverse pool of members and

for current popularity among young adults. An adapted snowball sampling method (Haas et al.,

2010) was used to locate accounts likely to provide the most useful data. This technique involved

locating an initial sample of five accounts as starting points for the sample. Initial accounts were

located by entering terms into the search bar of each individual social media site. Search terms

were selected in accordance with the recommendations of Lewis and Arbuthnott (2012), whose

research was designed to explore the search terms most often used by those seeking out pro-

eating disorders websites in the United States and other countries. Search terms used to locate

pro-ana accounts included pro ana, pro-ana, pro ED, pro-ED, thinspo, thinspiration, bonespo, ana

buddies, and ana family. Search terms that were employed to locate recovery-oriented accounts

included ana recovery and ED recovery. Search terms used to locate anti pro-ana accounts

included anti pro-ana, anti pro ana, anti pro ED, and anti pro-ED.

Once these initial accounts were located, additional accounts were found by examining

the followers and followed lists linked to the initial accounts. Consistent with previous studies

employing a grounded theory approach to analysis, twenty pro-ana accounts from each site were

selected (Norris et al., 2006). Additionally, a total of ten accounts reportedly focused on recovery

from anorexia and other eating disorders, or anti pro-ana, were examined for characteristic

comparisons with pro-ana sites.

Accounts were only included in the sample if several criteria were met. Consistent with

criteria specified in previous research (Gavin et al., 2008; Tong et al., 2013), accounts included

in the analysis were required to be 1.) Accessible to the public (i.e., no special permissions

needed to view account content), 2.) Demonstrate activity within the previous week for

individual accounts or within the previous month for accounts maintained by an institution (e.g.,

National Eating Disorders Association) through a post authored by the individual or institution

that maintains the account (this post did not need to be original content), 3.) Have a minimum

base of 50 followers, at least one of whom interacts with posts (e.g., commenting, liking,

reblogging) once per every five posts made by the account holder.

Data Storage

Due to the aforementioned policies of the social media sites that were used for this research prohibiting or restricting the types of content permissible on their platforms, a method for preserving account content as it appeared during analysis was critical. Thus, posts to be used in the analysis were converted into PDF format (through the print screen option to "save file as pdf") to prevent loss of the data if the account was removed. Each individual PDF was de-identified, protected by a password, and stored on the principal investigator's password protected laptop. During data analysis, de-identified data were transferred to coders on a password protected USB drive. This procedure helped mitigate the possibility of lost data due to pro-ana content or accounts being sought out or reported and removed by the host social media sites.

Data Analysis

Grounded theory. Grounded theory is a naturalistic, inductive method for examining psychological phenomena qualitatively (Charmaz, 2008; Giles, 2002). Grounded theory also emphasizes examining the phenomenon of interest within its context (Giles, 2002). This method is designed to begin inductively with individual cases and create abstract categories that can synthesize, interpret, and identify patterns in the data (Charmaz, 2008). Grounded theory is primarily interested in examining the fit between the data and an emerging theory, rather than on making statistical inferences about a target population (Charmaz, 2008). Within grounded theory, data analysis often begins early in collection; thus, early analysis assists in the shaping of ongoing data collection decisions (Charmaz, 2008).

Grounded theory particularly emphasizes defining processes that are relevant to the phenomena under study (Bryant, 2013; Charmaz, 2008). Specifically, of interest in many grounded theory studies are the various factors (or functions) of underlying processes. These

may include the participant's stated explanation of a behavior, the unstated assumptions about the behavior, rationale for engaging in a behavior, the way others react to or are affected by a behavior, and the perceived consequences of engaging in a behavior (Charmaz, 2008). Charmaz suggested that it is vital to a grounded theory study for the researcher to remain constantly engaged in analysis of the data (2008). This means that the researcher must be vigilant regarding questioning implicit or unstated aspects of the phenomenon and remain engaged with further investigation of subtle processes emerging in the data (Charmaz, 2008).

Often all stages of sampling in grounded theory research are broadly referred to as theoretical sampling (Bryant, 2013). The use of this broad term to refer to all stages of sampling is primarily done to differentiate the sampling technique employed by grounded theory from the random sampling techniques used in quantitative research (Bryant, 2013). However, each individual phase of data collection is elucidated here. In the present study, the data collected from the five initial cases informed the codes that were investigated in the subsequently selected accounts. These five cases comprised the open sampling phase of grounded theory data collection (Giles, 2002). Open sampling was used to collect enough cases in order to begin the coding process (Giles, 2002). The second phase of data collection was relational sampling, which entailed the collection of additional cases on the basis of the codes that emerged from the initial sample (Giles, 2002). In the present study, this phase was accomplished through the identification of additional accounts appropriate to the analysis based on the initial codes. These accounts were located by examining the followers and followed accounts of the initial sample, rather than entering terms into the sites search bar. After coding of the initial five accounts for each site, seven accounts from Instagram, and 10 accounts each from Tumblr and Twitter were collected during relational sampling.

After appropriate accounts were selected and converted into PDF format they were

entered into the qualitative data analysis program ATLAS.ti version 7 (Muhr, 2015) for coding

and analysis. ATLAS.ti allows the researcher to easily upload documents, assign codes to

segments or passages in the text, write memos, and sort codes into broad categories.

Additionally, ATLAS.ti offers the option to view complex networks of relationships between

codes and categories to facilitate analysis of patterns in the data. Coding the data entailed two

distinct steps. First, line-by-line coding, or open coding, of the data was performed (Charmaz,

2008; Henwood & Pidgeon, 2003). This phase of coding the data involved "examining each line

of data and defining the actions or events that appear to be occurring in it or represented by it,"

(p. 93) and assisted the researcher in separating the data into categories and becoming aware of

processes occurring in the data (Charmaz, 2008). Line-by-line coding framed concepts in short,

specific, and active terms (e.g., describe what is happening or the behavior of participants)

allowing the researcher to define processes in the data that may otherwise remain tacit (Charmaz,

2008; Giles, 2002). The second phase of coding was focused coding (Charmaz, 2008). This

phase of coding involved utilizing the most significant and/or frequent codes produced in line-

by-line coding to examine larger segments of the data (Charmaz, 2008). These focused codes

formed the basis for the conceptual categories defined in the next stage of analysis.

After focused coding, conceptual categories were developed. These categories, "explicate

ideas, events or processes in the data," (p. 98) through a narrative form (Charmaz, 2008).

Conceptual categories move the analysis away from the use of concise codes and into the early

stages of using full narrative descriptions of the categories represented by the codes (Charmaz,

2008). In order to generate categories from focused codes, it is necessary to compare data,

incidents, contexts, and concepts that emerged during coding (Charmaz, 2008). This comparative

process is repeated throughout all phases of grounded theory analysis and is often referred to as

the "method of constant comparison" (Henwood & Pidgeon, 2003, p. 136).

After completion of the initial phases of coding, the second or axial phase of coding

began (Bryant, 2013; Giles, 2002). The first phase of axial coding in a grounded theory approach

to analysis is memo-writing (Bryant, 2013; Giles, 2002; Henwood & Pidgeon, 2003). Memo-

writing is a process by which categories are broken down into their component parts, helping the

researcher to identify the codes that should be treated as categories for further analysis

(Charmaz, 2008). Additionally, memos help the researcher operationally define each category

being considered for further analysis (Charmaz, 2008). According to Bryant (2013), "[t]he key

to memo-writing is to use them to express in writing and then to develop one's ideas about codes

and their inter-relationships" (p. 118). Giles (2002) suggested that memos need not all be in the

form of text. He also indicated that creating diagrams can be a useful strategy for illustrating the

connections between initial codes and creating higher order categories (Giles, 2002). In the

present study, memos were written regarding codes or groups of codes that were likely to be

retained as broad categories at the conclusion of the analysis. Input from research assistants

regarding which functions were most salient during their examination of the data were also

considered and explicated during memo writing. Relationships between codes were explored and

defined in memos and provided clarification for the resulting category. Codes that did not occur

frequently or did not otherwise provide compelling evidence of importance on pro-ana social

media accounts were dropped from use in development of final functions.

The final stage in analyzing data through grounded theory is theoretical sampling.

Theoretical sampling consists of "collecting more data to illuminate theoretical categories"

(Charmaz, 2008, pp. 103). In this phase, additional data are collected with the purpose of

developing the emerging theory and ensuring that it accurately describes the participants'

experiences, rather than for its representativeness of a population or to improve generalizability

(Charmaz, 2008). Throughout this phase the researcher should elaborate the meaning of

categories, discover variations in categories, and elucidate gaps between categories (Charmaz,

2008). While the other phases of analysis should be conducted relatively early in data collection

and may be returned to and revised often, theoretical sampling should not take place until data

collection is nearly complete and categories are reasonably well-defined (Charmaz, 2008;

Henwood & Pidgeon, 2003). If conducted prematurely, theoretical sampling may bring an

inopportune ending to data analysis (Charmaz, 2008). When no new categories were emerging

from the data, no additional accounts were sought out. Then, theoretical sampling to locate cases

which are representative of the emergent themes was conducted. In the present study, saturation

of themes occurred earlier in the analysis than was anticipated. Several accounts were located

that contained rich comment sections and expedited overall analysis. Thus, sampling was

concluded after collection of three accounts from Instagram and five accounts each from Twitter

and Tumblr during theoretical sampling. This resulted in 15 accounts from Instagram and 20

accounts each from Tumblr and Twitter. This was fewer than the anticipated sample; however,

due to lack of new codes emerging from the data, sampling and analysis were concluded.

Concluding Data Analysis

Once adequate representations of the themes were collected, the data analysis was

considered complete. A comparison between the themes that emerged and the functions

supported by previous literature was conducted. Finally, the implications of the findings of the

current study for the regulation of emotion in anorexia via ever-expanding social media sites and

the potential for the clinical use of social media in assisting those engaging in extreme eating

behaviors was explored.

Results

The final analysis included a total of 550 posts from 55 accounts ($n_{Instagram} = 15$, $n_{Tumblr} =$

20, $n_{Twitter} = 20$). Saturation of themes was reached more quickly than anticipated; thus, data

collection was concluded with fewer than the anticipated 110 accounts. Additionally, 10 pro-

recovery ($n = 8$) or anti-pro-ana ($n = 2$) accounts were collected for comparison. Eight primary

themes emerged from the analysis (see Table on p. 36).

Defining Anorexia

Account holders and commenters on pro-ana accounts viewed anorexia as 1) a disease

from the point of view of the medical model, 2) a lifestyle choice, or 3) part of their identity.

Discussion regarding views on anorexia occurred in 268 posts, of these 171 (64%) endorsed

viewing anorexia as a disease, 65 (24%) saw anorexia as part of their personal identity, and 32

(12%) considered anorexia a lifestyle choice.

When discussing anorexia as a disease, account participants referred to anorexia as a

"serious condition" (ICIN001), "an illness" (ICIN003), "a disorder" (ICIN002), "a diagnosis"

(RSIN009), or "as a condition" one suffers from (ICTU001). These phrases imply account

participants' use of a medical model of anorexia.

However, other participants considered anorexia part of their identity. The following

comments from several account participants demonstrate this perspective:

I'm not glorifying starvation…but it's who I am… (ICTU001)

A cycle of binge, gain, starve, lose. This is what I've become… (RSTW006)

My mental illness defines me. It defines my self-worth. It defines my beauty. It defines

the way others see me (RSTW017)

Starvation and anorexia were experienced as primary features of participants' identities

and these behaviors were described as the most salient aspects of the self.

Finally, others explained anorexia and self-starvation as a lifestyle. Participants on social

media accounts described this lifestyle in the following ways:

I think it's a lifestyle… (ICIN003)

Yeah they think eating disorders are a 'lifestyle' (RSIN015)

It's not a diet, it's a lifestyle (ICTU001)

These comments suggest that self-starvation reaches beyond a method of eating or relating to

food and becomes a way of living one's life. Discussions surrounding extreme food restriction as

a lifestyle choice were often tense. Those opining a lifestyle attempted to defend their position as

one that applies to them alone and does not imply promotion to others, while other commenters

argued that the mere suggestion of starvation as a lifestyle was dangerous to those who may be at

risk for engaging in restriction.

Defining Thin

Another function of pro-ana social media sites that was identified in this analysis was

defining what it means to be thin. Posts seem to answer questions such as, "How would it look to

be really be thin?" "How would it feel, physically and emotionally?" and, "How would other

people see you?". Overall, these posts provided rules about how one would look, feel, and be

reacted to by others if they were doing anorexia correctly.

Obtaining a gap between one's thighs, flat stomach, prominent bones, and thin fingers were often the focus of posts defining how a person who is truly thin would look, as discussed in the following posts:

Feet together, thighs apart, the collar bones are where we start. Count the ribs and feel the hips, that's what makes us skinny, bitch. (RSTU017)

Flat belly, skinny thighs, Very easy on the eyes. Knees together, thighs apart Figure that could break your heart. Slim, skinny, small, petite Like a feather on her feet. Tiny waist, collar bones Thinspo filling up her phone. Knee socks, tiny dress Hair up in a sexy mess. This is ana, I know her well She's the one to whom I dwell. (RSTU012)

Smaller face, bigger eyes, visible bones, tiny thighs. Flat stomach, narrower chin, thinner angles, tighter skin. Bony fingers, yellow lips, gap between thighs, pretty hips. Maybe if i starve myself at least I'll be beautiful, forget my health (RSTU016)

These posts also serve to specifically link the achievement of the physical features that define thinness to self-starvation and anorexia. The final post indicates that obtaining thinness was perceived to be more important than overall health. This again demonstrates that those posting to pro-ana social media accounts were aware of the consequences of starvation on their health; however, they were engaging in the behavior despite this knowledge. These consequences did not seem to be of sufficient magnitude to counter the positive consequences of anorexia.

Physiological indicators of thinness were also a topic of frequent discussion, as can be seen in the following posts:

I want my stomach to hurt, because I know it means I'm getting thinner. I want to feel cold all the time, because it means there's less fat on my body making me sweat. I want

to be disgusted by the thought of food. I just want to starve my fucking life away

(RSTU016)

You dont even recognize the feeling of being hungry anymore… (RSTW006)

These posts suggest that several of the physiological symptoms of anorexia were perceived as positive indicators by those on pro-ana social media sites. The symptoms were viewed as the body providing signs that it is achieving a state of marked thinness. Altered physical sensations of hunger, in particular, were discussed as affirmative indicators of becoming thin.

Finally, changes in the ways in which others perceive and react were salient indicators that a state of thinness was being achieved. Others' positive reactions were also often linked with personal experience of increased positive emotions, as stated by these posters:

I just want to have collarbones to have a thigh gap to have thin fingers to have people talk about how skinny I got to look good in everything I wear to be skinny to be perfect (RSTU020)

It's my biggest motivation to wake up and see my skinny body in the mirror and to walk around like the happiest person in the world. To fit in the skinniest of skinny jeans, to throw on anything and be happy with it. Be looked at by others and they say wow she's so skinny I would kill for a body like hers… (ICTU005)

Looking good to others, no matter what clothes were worn, and to inspire envy in others were suggested as markers of thinness. This positive social attention from others was also stated as a source of salient motivation to engage in behaviors associated with anorexia. Positive social attention may be a more salient factor than personal physical health that helped to maintain self-starvation.

Describing Anorexia as Cyclical: Recoverlapsing

Recoverlapsing was a term created by participants on social media sites to indicate their experience of the cyclical, chronic course that becomes familiar to many people with anorexia. Participants expressed both a desire to continue restriction and to recover, depending upon whether they find themselves in a period of relapse or one of recovery.

Yes, I'm aware that there are healthier ways but this is the way that works for me…This way, I can lose steadily and be in control. This is what I need right now. This is what my life needs. (RSTU019)

And before I get floods of "you're perfect the way you are!" "You don't have to do that! There's other ways there's no need to lose weight to be beautiful" etc etc I'm going to say yes, I do have to. I really do have to. And maybe someday I can recover from these thoughts but right now? I don't want to… (RSTU006)

These participants indicated that their disordered eating behavior was functional for them, in this moment, while allowing for the possibility that there may be a time in the future when these patterns were no longer useful and thus recovery would be undertaken. This suggests that for some participants, disordered eating was an attempt at solving problems that exist in the current emotional or contextual space, which may or may not persist in the future.

Your eating disorder will always stick with you whether it's now or 20 years from now and you're making dinner for your child. (RSTW017)

Other participants focused on their perception of their disordered eating as a certainty in the future, instead of a necessity only in the present. This implies the belief that even if one chose to alter her behavior immediately, the possibility of relapsing into disordered eating patterns

would always be available should she encounter a situation similar to those in which she

restricted in the past.

Posts also suggested that the state of recovery or relapse was not determined by education

and information about the negative physical consequences, even death, which can result from

periods of prolonged self-starvation:

Me: *is aware of death caused by starvation* Me: *continues to restrict and deprive body

of food*. (RSTW013)

This suggests that other factors are likely to exert a greater influence over whether those with

anorexia feel ready and will try to recover. While some of these factors may be elucidated

through the present analysis, further clarification is needed to determine alternative targets for

intervention. Given that many current interventions, such as Cognitive Behavior Therapy-

Enhanced (CBT-E), focus on psychoeducation regarding the physical impact of restriction these

posts suggest that this information is not likely to motivate clients to change by providing new

information about health consequences.

Some participants' posts suggested they were quite literally occupying the liminal space

between recovery and relapse:

I forgot about the intense hunger that comes with fasting. I've become such an amateur

haha. But I've done it before, I should be able to do it again. (RSIN009)

Purging in the bathroom of my therapist's office. I think I've hit a new low. (ICTW003)

The first participant expressed struggles relating to taking up previously abandoned patterns of

self-starvation. This indicates she was beginning a new phase of relapse, after achieving at least

some degree of recovery. The second participant was in a space aimed at recovery (the

therapist's office), while still engaging in disordered eating behavior. This suggests that, though

other posts made relapsing or engaging with recovery appear to be easy choices, even once they

desire to recover, participants find it effortful to learn new patterns of behavior to serve functions

previously obtained through eating disorders.

(Self-)motivation

Providing motivation for continued starvation emerged as a fourth function present on

pro-ana social media accounts. Many motivational posts presented lists of reasons to continue

engaging in disordered eating behavior, as described in the following posts:

Do it for the croptops, The short shorts, The sleeveless dress, The collar bones, The thigh

gap, The toned legs, The beauty of it all. (RSTW020)

So I can walk without my thighs rubbing together. (ICTU001)

Acceptable types of clothing that could be worn when skinny were often reasons to

continue restriction of caloric intake. Additionally, appearance of bodily features such as a space

between the thighs and visible collar bones were common themes for motivational posts and

often accompanied images of these features.

Motivation through presenting self-starvation as an act of will power and strength was

also common on pro-ana social media sites, as stated in the following posts:

It's a matter of will power and inner strength. (ICIN003)

The moment you realize you have full control over yourself and over your eating

tendencies, you will lose the weight you thought you couldn't. (RSTW015)

Not eating today and hopefully not tomorrow either I want to see how far I can last for.

(RSTW014)

The ability to starve was often considered as a sign of self-control and the urge to eat was

a sign of loss of that will power. Restriction was portrayed as a challenge to counter the body's

need for food and to demonstrate the power of the individual's mind to exert control over the

body's needs. Thus, the ability to restrict food intake was regarded as a positive skill that

indicated overcoming one's physiology.

Self-starvation was also commonly explored as a means to demonstrate that participants

were engaging in the behavior from their own volition and could not be controlled by others. For

example:

There is nothing stopping us from being like that..let's do it. (RSIN010)

 "starving yourself won't make you happy" Just you try to fucking stop me. (RSTW018)

These posts indicate that self-starvation was perceived as always under the control of the

individual and not of others in the environment. This may function to maintain self-starvation by

providing individuals with a sense of autonomy over their bodies at times when other aspects of

their environment were perceived as unpredictable or uncontrollable.

Motivation was also achieved through requesting and sharing rules for achieving

restriction with others in the social media community. As presented by poster RSTU019:

Rules: You must have 2+ liters of water a day, you must fast 3 times a month, you cannot

eat after 7PM, you have to walk 10,000 steps a day.

A skinny daily routine: 1. For breakfast drink unsweetened green tea with lemon juice. 2.

Try to walk home when school ends. Keep track of the calories you lose by doing this,

with apps like runnastic. 3. Lunch should be under 250-300 calories, it's better to avoid

carbs. 4. Drink 1 full cup of water every hour. Set phone alarms if you want to! 5. If you

feel hungry eat fruits and vegetables. If you don't feel like eating those, you may be

experiencing cravings. Get your mind off it. 6. Go for a run! Even if you're not used to it,

start off with small, slow session. It's always better than doing nothing. Don't forget to

bring a bottle of water! 7. Once you get home, drink two large cups of water. It's

important to stay hydrated. 8. After a rest, and its evening now, do a before bed workout.

You can find the one I created on my blog. 9. It's better not to dinner, even because you

should be sleepy and tired because of the workouts. If you really feel like you can't, fruits

and vegetables are your best friends. 10. Try to sleep at least 8 hours.

Sharing rules and tips for self-starvation may help to motivate both the poster and those

who view the post by making engagement less effortful and more socially acceptable. Reducing

the effort needed to determine ways to successfully restrict intake may make self-starvation an

easier option. Exposure to others' techniques for restriction may also motivate the individual to

develop or continue their own disordered eating through social comparison. Additionally,

comparison between the individual's own rules for restriction and those of other participants may

encourage escalation of problematic eating patterns, if others' rules were stricter.

A final type of self-motivation on pro-ana social media was self-shaming posts. Content

of these posts often portrayed hunger and eating as shameful, for example:

When you're hungry, Here's some motivation for you: 1. You will be FAT if you eat

today, just put it off one more day. 2. You don't NEED food… 12. If you eat then you'll

look like those disgusting, fat, ghetto and trailer-trash hookers on Jerry Springer…15.

People who eat are selfish and unrealistic…26. Starve off the parts you don't need.

They're ugly and they drag you down. 27. Nothing can't be fixed with hunger and weight

loss. 28. Saying "no thanks" to food is saying "yes please" to THIN!!!...32. Nothing

tastes as good as thin feels. 33. Is food more important that happiness in life? I think not!

34. Eating is conforming to everyone else's expectations. 35. When you start to get dizzy

and weak you're almostthere. 36. Hunger is your friend and it won't betray you like food.

37. Food is mean and sneaky. It tricks you into eating it and it works on you from the

inside out making you fat, bloated, ugly and unhappy… (RSTU019)

Eating was presented as leading to undesirable physical and social consequences and

represented a lack of autonomy, while hunger was desirable and an indicator of achieving goals.

Thus, shaming for eating could function as motivation to achieve the acute physical feelings of

hunger that accompany starvation. However, for other pro-ana site participants hunger did not

represent success, as demonstrated in the following post:

You're not fucking hungry, okay? You're not fucking hungry. It hurts, but you're not

hungry. It's growing pains, you're growing prettier for every hour you don't shovel food

down your throat. Remember, 12 hours without any food in you system and your body

will feed on itself. 12+12+12…. Count the hours, count the calories, and put down the

damn fork. (RSTU010)

Posts which portrayed hunger as shameful may serve to motivate participants to continue

restriction despite the physical discomfort that accompanies it. This post, as with other

motivational posts, seemed to imply that self-starvation was a form of control and strength. The

link between self-starvation and control was made explicit in another post by RSTU010:

Dear me,

Have some goddamn self-control. If you want to lose the weight, you need to fucking

WORK for it. If you want the number on the scale to change, the number on the tag in

your jeans and the Number of the tape measure around your hips, you need to WORK.

Don't fuck up again. You WILL have self-control, from this moment forward. Promise

yourself that.

In this post, disordered eating behaviors were equated with willingness and ability to accomplish a challenging task. Harsh language was used, which may suggest that self-shaming was an important way participants maintained their motivation to continue problematic eating patterns. It may also indicate the degree of frustration that participants felt when they "failed" to successfully engage in restriction.

Social Attention

Posting pro-ana images and text elicited a variety of reactions from other participants on social media sites, suggesting that attention and confirmation from others may be an important function of pro-ana social media accounts. Many commenters reacted negatively to expressions of pro-ana or anorexia-related content. However, comments varied in their degree of negativity. For some, the poster's expression of their disorder elicited a negative, but sympathetic and concerned reaction, as was explored in the following comments from RSIN015's account:

> Please be healthy and keep your body safe. I know I don't understand completely your situation and I don't know you but I do want you to live to an age where you are happy and healthy … you have to give your body everything it needs to successfully maintain itself, which is a frequent supply of good food. I love you and I'll be praying for you. (commenter 1)

> please do everything you need to be happy you don't deserve to starve yourself, you deserve to LIVE! I'm not gonna report you or anything, but you're worth so much more than pain, okay? trust me, keep getting help. Life gets better in recovery. (commenter 2)

These commenters were posting in response to an image of the account holder's thin appearance. They were attempting to gently discourage continued self-starvation out of concern for the account holder's health and physical safety. These comments also linked recovery and a

healthy body with happiness and longevity. Finally, these comments often expressed affection

for the account holder.

However, most comments that reacted negatively to anorexia-related content did not have

an affectionate discouraging tone. The most frequent negative reactions ranged from invalidation

of the account holder's experience of their disorder, to blaming the account holder, or to shaming

the account holder for their illness or for experiencing difficulty with changing. Invalidating

posts typically indicated that the account holder was wrong about some aspect of their

experience of their body or of eating, for example:

> I do not care what you think about your thigh I think they are super sexy (RSTW014)
>
> food won't make you big honey it'll only make you live :c (RSIN012)
>
> I don't think u should lose anymore weight because you aren't fat in the slightest bit. I
>
> don't think it's healthy or safe for you to lose more weight. You are much skinnier than
>
> most people I know so I think ur just fine. Your body is great so u shouldn't worry about
>
> it… (RSIN015)

These comments were likely intended to be benign discouragement of disordered eating

but may have been experienced by the account holder as invalidating of their experiences. These

comments focused primarily on how the commenter viewed the account holder and their body or

eating patterns more so than on aspects of the account holder's environment or physiology that

might support their experience. These comments also assumed that the behavior was simply a

product of feeling fat and did not consider other aspects of restriction that might be reinforcing

the behavior. Finally, these comments reinforced notions that the opinion of the social

community represents the ultimate authority in providing rules regarding acceptability of

appearance and private experience of one's body.

Other commenters moved from invalidating the account holder's experience to indicating that recovery was a simple matter. Essentially, these comments blamed the individual for their struggle to change or for the development of their disorder, as occurred in the following comments:

You CAN do that. You just didn't want to. It's a matter of making yourself eat it and to not listen to your ED. (RSIN007)

Babe listen, your obviously beautiful you need to realize that!! Your not fat I'm stating that, right now!! Eat all you want!!! This is your life. If you don't like it look at it in a different angle… (RSIN010)

you need to learn to love yourself, see the beauty in yourself, realize you deserve food and so much more. (RSTW009)

If you don't change your attitude you will die (ICIN003)

Recovery and change were portrayed as simple matters of alteration of attitude toward one's self. While continued engagement in restriction was considered to be a choice to take a negative attitude toward the body and toward food. These posts also implied that it was the responsibility of the individual alone to change their attitude and recover, without consideration for the usefulness of help from others.

Finally, many negative reactions shamed or insulted the individual for struggling with their weight, shape, eating, or for posting their struggles on social media. These comments represented the most frequent negative reactions, examples of these comments included:

…you should put some meat on your bones and actually eat you anorexic bitch (RSIN013)

your account is just wrong, posting pics online just to check your weight.. smh [shaking

my head]. plus you really don't need to lose weight girl you're so skinny, you need to find

a balance and to love yourself for the way you are. (RSIN015)

You should just stop! You have a stupid fucking problem in your brain and you let it

conquer you. Its ugly and EVERYBODY thinks it. The only people who actually think

its nice is other people with the stupid disorder. (RSIN012)

Comments typically insulted the account holder's intelligence, will power, choice to post

online, and/or appearance. The comments seemed to recognize that the individual had a disease

but also indicated that they should feel bad about having this specific disease. Although these

comments promoted recovery and weight gain, they did so by attempting to shame the individual

into compliance with recovery, making these comments highly concerning. Posts also often

linked anorexia-related content with attention-seeking behavior, as illustrated by another

comment on RSIN015's account stating "she obviously wants the attention because she is

posting it". Desiring attention from others was a particularly ridiculed perceived reason for

posting pro-ana or anorexia-related content on social media accounts.

While the majority of reactions to anorexia-related content were negative, many posts

elicited a positive response from commenters. Positive responses often indicated the commenter

envied the account holder's appearance or suggested that a very thin appearance was highly

desirable, as illustrated in the following posts:

Hi, I like your body. You've stunned me honestly. I was looking at your pictures until my

battery died… (RSIN015)

Huge difference for suck a short time! How did you do it? Eat less? Or nothing???

(RSIN010)

>You are wow. Like wow. Tan and thin and perfect. (RSIN014)

Positive comments were typically linked to images of the account holder's thin appearance, often an image of their thighs, flat stomachs, or protruding hip and rib bones. Comments indicated that this body shape was socially desirable and admired by others. Additionally, some comments directly linked restriction or fasting to achievement of this body type, but did not consider this problematic. This provided support not just for a thin body, but also for the pattern of eating behavior that led to a very thin body. These specific compliments may also serve to maintain the individual's problematic eating by providing reinforcement for both thinness and for the behavior patterns that produce it.

Venting

Expression of negative emotions was also a primary function of pro-ana social media spaces. Among participants this expression was termed "venting." Negative emotions including frustration, sadness, envy, disgust, fear, and hopelessness were recorded 663 times throughout the 550 posts collected during this study. Emotional expressions often overlapped, as exemplified in this post by ICIN002:

>Everything's just hit me all at once. I can't do this, I can't eat my three meals a day like I promised everyone. All I've eaten today is my breakfast and three fork fulls of rice and a bite of a sandwich and I'm not allowing myself to eat dinner. What a fucking mess. I've been asleep almost all day, I have no energy and I don't want to go out because I can't be bothered. I want things to go back to the way they used to be, I can't cope. My head absolutely wrecks and I have no one to talk to about it all because everyone thinks I'm better.

Expressions of frustration, disgust, sadness, and fear commonly occurred together, suggesting that participants feel many negative emotions both in their struggle with restriction and regarding their bodies. These posts often implied a sense of desperation both to recover and to maintain their starved state, all of which were able to be expressed (or "vented") only on anonymous social media sites.

Many posts indicating disgust were related to the ways in which participants experienced their weight, as illustrated by RSTW012:

There's more of me to hate at a higher weight.

This post exemplifies the link between participants' disgust and their experience of weight gain or maintenance of a normal weight. The implication of this post and others like it is that feelings of disgust can be eliminated by achieving and maintaining a lower body weight. This implies that restriction may serve an emotion regulatory function for site participants.

Disgust at one's own body was frequently expressed in combination with envy of another's. Envy typically occurred in relation to images of very thin women posted on social media accounts. RSTW015 describes envy in the following statement:

WTF how do people get like this?! I literally don't eat why am I not like this yet??
This post suggests a desire to achieve a very thin appearance, as presented in the accompanying image of a very thin woman wearing a bikini standing on a balcony in a tropical setting. The participant was also indicating that this desired appearance was only achievable through self-starvation. The following post provides details regarding the aspects of the body of which participants were particularly envious:

I am too fat, my belly is gigantic. you wouldn't understand, you've got a flat stomach and you're pretty (RSTW012).

I have a hunger for bones I crave thin and thigh gaps and a tiny BMI; Not food Not

calories Not fat (RSTW009).

Flat stomachs, thigh gaps, low BMIs, and visible bones were often discussed as points of

envy for account participants. Posts also expressed that the route to attaining these envied

features for oneself was through avoiding food and calories. Posts implied that envy was

escapable through restriction and starvation. Expressions of these desires may also have been

particularly prevalent on social media, rather than in the participants daily life, as these desires

may not be reinforced by their usual verbal community.

Another commonly occurring negative emotion was fear. Fear was often expressed in

relation to eating and weight gain, such as in the following post from ICTU004:

…i weighed as 126 and i felt on top of the world. but i went over my friend's house

yesterday and we ate soup and crackers and pancakes but i walked a lot around her

backyard. then today i ate some healthy stuff plus some caramels (1 tbsp is 50 calories)

so im too scared to look at the scale. if i get back on track ill check my weight again but

yesterday and today i skipped my daily routine.

Fear of gaining weight as a result of engaging in more consumption of food than they

would typically allow themselves was common. As expressed above, this fear was often

alleviated by through compensatory fasting during the following day and avoiding checking their

weight. However, fear was also occasionally expressed regarding the physical consequences of

self-starvation. As expressed by RSTW015,

The worst part being an underweight anorexic is theres a voice in your head everytime

you look in the mirror that says look at what you done.

This suggests that account participants were aware of and, to some degree, feared their emaciated state. Recognition and concern about the physical consequences of maintaining a low body weight stand in contrast to typical perceptions in the fields of medicine and psychology, which maintain that clients with anorexia do not know they are underweight or do not take their low weight seriously (Waller, 2012). Although fear of both high and low weight were present, expressions were more commonly about weight gain suggesting that apprehension about the consequences of starvation were not sufficient to overshadow negative emotions surrounding weight gain.

Finally, venting of sadness was common. Sadness typically occurred in the context of failure to lose weight or to lose fast enough as discussed by RSIN014 and RSIN011:

…I hate today so much lol it's all a reminder that I fucked up over and over I can't get people to stay and I can't manage to lose weight fast enough either. It's just one of those days where every little thing feels like a shard of glass piercing through your heart :-) … Tbh I really just want to get back to this weight and below I don't even really care. I was just here not that long ago till I had to gain some back but I have 0 intentions of ever getting better honestly lol …(RSIN014)

Today's intake was some homemade palao dark chocolate bites, I had 3 so I probably had around 400cal but I think I burned it all off idek 😰🥶, I feel like the ugliest fattest person alive I feel so lonely and broken hearted lately I've just wanted to die I have nobody I wouldn't be missed 💔😔 (I'm sorry I'm so negative I hope I'm not triggering anybody I just want to feel happy)… (RSIN011)

For these participants, the sadness appeared to be occurring primarily in the context of difficulties in social relationships. Sadness was then linked to and amplified by lack of weight

loss or feelings of fatness, the solution for which is continued restriction of caloric intake to achieve a lower weight. Thus, perceived social unacceptability of higher weight may have impacted participants' social difficulties, leading to increased private experiences of sadness.

Feelings of happiness were also expressed by account participants. Happiness was experienced as a highly sought after emotion that can be attained through self-starvation and becoming skinny. As discussed by RSTW006 and ICTU005,

I can't help but think I'll be happy when I'm skinny. (RSTW006)

It's my biggest motivation to wake up and see my skinny body in the mirror and to walk around like the happiest person in the world. (ICTU005)

This post juxtaposed the participants' current state of being sad and perceiving themselves as something other than skinny, with the happiness they believe will be acquired when they reach a state of thinness. Their posts also suggest that feeling happy may be an important way that those affected by anorexia would be signaled that they are finally "thin enough" and thus able to stop restricting.

However, restriction, hunger, and weight loss themselves become linked to happiness, as described in the following posts:

It's literally so addictive watching yourself shrink every day. (RSTU006)

I become satisfied when I step on the scale to see I have lost, and when I burn off all my calories I become satisfied through my ED [eating disorder]. (RSTW009)

Being hungry makes me happy... I love laying down at night and hearing my stomach growl. (RSTU009)

These participants have begun to derive happiness from a starved physiological state and problematic eating and weight loss behaviors, rather than from the idea of becoming skinny.

Although thinness may be the initial route through which happiness is perceived, an apparent

shift occurs through which the disordered eating behaviors and actual consequences (rather than

the idea of a state of thinness) become the route to happiness.

Self as Body

The self was often discussed as being "fat" and desiring to be "skinny." These were

examined not only as physical states of the body, but also as part of the poster's personal identity

(e.g., am fat, will be skinny). These posts broadly suggested that, for participants on pro-ana

social media sites, the self may be defined as the body in isolation, rather than an integration of

one's physical body and other attributes. Many posters expressed a wish to have a body that is

thin and therefore a self that is happy:

> I can't help but think I'll be happy when I'm skinny (RSTQ006)

> Stay strong. Day one of fasting may seem impossible, but you can and you WILL BE

> thin. Just starve forever. (RSTW007)

These posts suggest that a physical identity as a body that is skinny would also lead

directly to being a person who is happy. Additionally, socially desirable traits, such as strength,

were frequently linked to self-starvation.

Most often, however, posts that discussed personal identity indicated frustration with

being a person whose body is fat. As expressed in one post by RSTW008,

> When I say "I'm fat" Its bc [because] I actually am Not bc I have a "distorted" image of

> myself Not bc I want you to lie and say "Ur not" Bc I am

This post indicates a strongly held perception of the self as being fat and thus necessarily

unacceptable and unlovable to others. Many posters on social media sites discussed fatness as a

relatively permanent and difficult to change state of being. This poster also suggests that the

function of expressing perceived fatness to others was not to elicit social support but rather

represents their perception of how they truly are, as an individual, and the importance of one's

body in defining that self. Fatness was also frequently linked to general self-deprecation, as

described by RSIN011:

> All I wish is that I was skinny I wish I was beautiful and could look at myself everyday
>
> and feel happy but all I am is fat and worthless.

This post indicated that participants' view of themselves and their bodies as fat may be

associated with broader feelings of self-worthlessness. It also juxtaposes an identity as skinny

and happy with their current perception of themselves as fat and therefore unacceptable.

Images

A final theme that emerged from the present analysis was the importance of images

across all three social media sites. Images appeared to serve a wide variety of additive functions

from providing motivation to achieve a body type similar to the depicted to soliciting reactions

from others regarding one's own appearance. Thus, images seemed to provide a physical

manifestation of the rules and goals promulgated by the pro-ana community to which

participants could compare themselves to determine whether they had effectively achieved those

goals. Images were evenly split between black-and-white and full color depictions and all images

were of lone women. The women were more often standing in a private space (e.g., bedroom or

bathroom) wearing partial clothing (i.e., half of the body covered, half uncovered) than to be

sitting or lying down, in a public space (e.g., outside), or to be fully clothed or unclothed. Degree

of thinness varied widely from women who were thin but did not appear malnourished, to severe

emaciation. Images most often displayed gaps between women's thighs, followed by protruding

hip bones, visible rib cages, and thin leg bones. While some images depicted collar, spine, or

shoulder blade bones, these were far less common. Most depictions were models or other non-personal images; however, many were photographs of the account holders themselves. Finally, the majority of images did not include the woman's face — only her body, often focused on one particular aspect (e.g., thighs or ribs). Images often accompanied text indicating a desire to achieve the depicted body type, deprecating one's own body, or requesting others' opinions on the image. Photographs served as an important point of discussion regarding the ideal body type and how skinny (and, therefore, happy and loveable) should appear.

Comparison of Account Types

Compared with pro-ana accounts, pro-recovery and anti-pro-ana accounts tended to make fewer posts and elicit fewer interactions (e.g., comments and likes) from followers. Most were maintained either by an individual documenting their own recovery or by a national organization (e.g., National Eating Disorders Association) promoting awareness and recovery. Pro-recovery accounts had a comparable number of followers to pro-ana accounts; however, they tended to post less frequently and obtain fewer responses from followers. In contrast to heavily image focused pro-ana accounts, pro-recovery and anti-pro-ana accounts primarily posted psychoeducational text-based content (e.g., health risks of malnutrition) with very few images. While there were some similarities between pro-ana accounts and pro-recovery and anti-pro-ana accounts — such as containing images, being casual in content tone, and maintaining spaces for community interaction — it appeared that the content and followers of these accounts were disparate.

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Discussion

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The present analysis of pro-ana social media sites indicates that these sites serve at least eight functions including defining the meaning of anorexia, defining what it means to be thin,

discussing the experience of anorexia as a recurring condition or recoverlapsing, motivating

one's self to continue to engage in disordered eating patterns, soliciting positive and negative

social attention, expressing positive and negative emotions or venting, defining the self and self-

worth through the appearance of one's body, and using images to provide a physical point of

comparison for rules and goals.

Attempts to define anorexia using several different models (lifestyle, identity, or medical

illness) were suggested by earlier research on pro-ana websites (Mulveen & Hepworth, 2006;

Strife & Rickard, 2011), and this also appeared in the present analysis. However, these studies

discussed only two views of anorexia, either as a lifestyle choice or as a medical illness. In the

present analysis, a third option emerged, anorexia as personal identity. Those who discussed

anorexia as their identity viewed it as an insurmountable and unchangeable aspect of the self,

rather than as a disease or a lifestyle choice they made.

Another unique function identified in this analysis was attempts to clarify and define

what it means to truly be thin. Participants used these sites to present and obtain support for

specific physical, physiological, and social aspects indicating achievement of the desired state of

thinness. This specific discussion of aspects of thinness has not been reported in analyses of pro-

ana websites and may be a unique feature of pro-ana on social media. Thigh gaps and protruding

bones were viewed as positive indicators of thinness. The physiological sensation of hunger was

discussed as both a positive indicator that starvation was occurring and as a sensation to be

avoided as it may lead to eating. Others' reactions were also important indicators of thinness.

These posts help to provide clinicians with insight into which aspects of thinness are most salient

and reinforcing for clients with anorexia. This may assist in determining which sensations and

reactions resulting from thinness must be replaced by clinical intervention. For example,

perception of others' reactions to various body weights may be a contextual factor maintaining problematic eating and weight control behaviors and thus an important area for intervention. Additionally, they may indicate areas for education regarding normal and healthy body physiology and appearance, which could be incorporated into recovery-oriented sites and in-person treatments.

Providing a space for discussion of anorexia as a chronic relapsing and recovering condition was also an important aspect of pro-ana social media sites. Given that fewer than half of those diagnosed with anorexia make a lasting recovery and that approximately 20% experience a long-term course of illness (Steinhausen, 2002), it is unsurprising that social media site participants had experienced or expected to experience periods of recovery and relapse. Many site participants viewed behaviors associated with anorexia as functional in the present but allowed for the possibility of recovery in the future. While this stance is somewhat encouraging for clinicians, it was also often implied that the recovery would be temporary and a return to restriction and starvation would always be an option, should the individual perceived a need to return to those patterns. This suggests that finding novel ways to build new skills for solving current problems may be an important target for intervention in psychotherapy. Helping clients with anorexia to build more functional problem solving skills may prevent the return to problematic eating and weight control behaviors. Development of functional problem-solving skills may be as or more beneficial to clients than the use of restored BMI as a primary criterion for treatment success in anorexia (Pike, 1998).

Providing motivation through images that accompanied text was a feature shared by both pro-ana websites and Facebook (Norris et al, 2006; Tuefel et al., 2013), which was also found in the present analysis of several other social media sites. Use of both images accompanying text

was present across the social media sites. This was of particular interest as Twitter and Tumblr were primarily text-based sites but typically demonstrated a combination of both text and images in posts. Motivational content often presented self-starvation as a socially commendable act of autonomy and strength, while hunger and eating were signals of weakness and shameful. Providing a context in which listening to one's body's signals is an act of autonomy and power may be a vital area of intervention for both in-person and online resources for those with anorexia. Additionally, presenting images or in-person models of happy, healthy-weight individuals may be helpful for creating and maintaining motivation for recovery. Thus exploring more adaptive behaviors that define strength (e.g., fueling one's body or sharing one's negative emotions with others) and providing reinforcement for those behaviors could represent important areas for online and in-person interventions.

The social desirability aspect of motivational posts also begins to imply another function of pro-ana social media sites, soliciting social attention. Social support for problematic eating behavior and very thin body ideals has been reported in several previous analyses of pro-ana online (Gavin et al., 2008: Haas et al., 2010; Mulveen & Hepworth, 2006; Tong et al., 2013). Previous analyses have suggested that this social support was offered through positive reactions to reports of disordered eating and images of very thin individuals. While positive reactions were also demonstrated in the present study, many negative or discouraging reactions were also present. Valence of the commenters' reactions did not seem to serve to deter pro-ana account holders. Negative reactions, ranging from polite discouragement to outright shaming, did not appear to motivate account holders to recover or to alter their behavior. This finding was particularly important as it indicates that any form of social attention may be sufficient to maintain disordered eating patterns or that attempts to merely discourage, without providing

alternative options, problematic eating behavior is not likely to support recovery. Thus, providing specific alternatives and providing attention primarily for engagement in new behavioral patterns may be particularly important in the treatment of anorexia.

The use of social media accounts to express and regulate emotions is consistent with past research on anorexia both through in-person studies (e.g., Espeset et al., 2012; Fox et al., 2013) and online (Juarascio et al., 2010). Many emotions reported by Espeset et al. (2012) to be regulated through various disordered eating behaviors were also present in this analysis, such as anger, sadness, and disgust. These emotions were among the primary emotions vented on pro-ana social media sites and linked with experiences of low self-worth and disordered eating behavior. However, in the present analysis the behavior most often reported along with expressions of negative emotions was restriction, rather than purging or over-exercising. This differs from Espeset et al.'s study (2012), in which participants also reported purging to regulate specific negative emotions. Positive emotions were also expressed and expected to be related to disordered eating behaviors. Researchers have also found that participants with anorexia linked problematic eating and weight control behaviors with positive emotions (Selby et al., 2014). Although many participants expressed happiness in conjunction with weight loss and restriction, they also suggested that happiness would be an indicator that these behaviors were no longer necessary. This contradicts Selby et al.'s findings that positive emotions were predictive of more frequent disordered eating behaviors, but it is consistent with their finding that positive emotion occurred after engaging in problematic weight loss behaviors. As expected, the frequency of posts expressing positive emotions was less than that of those reporting negative emotions.

Previous studies examining pro-ana websites have reported that identity formation and maintenance was an important aspect of these sites (Gavin et al., 2008; Haas et al., 2010), similar

to the discussion of body as identity observed in this study. However, these studies reported on

formation of a group identity, while the present analysis indicated formation of personal identity

defined by the appearance of the body. For many site participants having a body that was

perceived as fat—and therefore bad —rather than thin—and therefore good—and having a place

to discuss this identity was an important function of pro-ana social media sites. Fat was typically

associated with the present self and represented that the individual was necessarily worthless and

bad; thinness was associated with acceptance by others and with being strong and happy. These

bodily characteristics were perceived as relatively global and stable aspects of identity. The only

way to alter one's fatness was through self-starvation to achieve a state of thinness. Altering the

learned equivalence relation between I–fat–bad and others–thin–good may be a vital area for

intervention. An experimental analysis of this relationship, similar to those employed in research

informed by Relational Frame Theory (Blackledge, 2003), is required to determine the

parameters of this relationship; this is recommended as an area for future study. Additionally,

addressing identity and self-worth as an integration both of the body and aspects beyond it (e.g.,

values and abilities) may represent vital aspects of effective intervention.

A final finding of the present analysis was the importance of images in supporting all

other functions (from motivation to soliciting social attention) across all three social media sites.

Images were prolific across all three sites, including Twitter and Tumblr, which were predicted

to be primarily text-based. Images typically depicted partially-clad women standing alone in a

bedroom or bathroom, whose faces could not be seen. Rather, the images focused on one or two

thin aspects of her body, such as thighs or protruding hip bones. Additionally, it was not

uncommon for the images to be a personal photograph of the account holder. This may suggest

that social media participants were particularly interested in obtaining social feedback about their

own bodies, not only in general attention for a thin ideal. Personalized feedback and nutrition plans, based on the client's body and needs, may be an important aspect of gaining buy-in during treatment.

In comparison with pro-ana accounts, pro-recovery, and anti-pro-ana accounts largely did not demonstrate the same content nor encourage active engagement as pro-ana accounts. Pro-recovery accounts were most likely to contain psycho-educational content through text. This content did not generate active and frequent engagement from followers (e.g., 10 to 20 likes on a post, compared to 50 to 80 likes on pro-ana accounts). This suggests that for pro-recovery sites to be effective they must begin to mirror the content on pro-ana sites, however in healthy ways, in order to elicit attention from their intended audience. Providing multiple images of real individuals who are recovering or have recovered from anorexia to promote a healthy body image may be beneficial, as images were frequent on pro-ana sites. Additionally, pro-recovery sites could reduce psychoeducation content related to health outcomes (as it appeared well-known, but not motivating, on pro-ana accounts) and provide more information regarding adaptive strategies for regulating negative emotions.

While the present study provides insight into the possible functions of pro-ana social media sites, several limitations should be noted. First, due to the largely anonymous nature of the internet, the precise characteristics of the sample are ambiguous. This study's findings may be challenging to generalize. Second, due to the policies of two websites (Instagram and Tumblr) threatening account deletion for the promotion of disordered eating, site users may not have been explicit in the promotion of anorexia as a lifestyle choice. This may have contributed to the greater prevalence of discussions of anorexia as a disease than as a choice, as this view would be less likely to result in termination of the users account. Third, only publicly available accounts

were sampled in this study. Content and functions of users who choose to set their accounts to

private may differ in important ways from those present on public accounts. Finally, due to the

qualitative nature of the present analysis the precise factors influencing the relationships between

the functions that emerged in this study and the symptoms of anorexia are unclear. Future studies

should examine these functions through experimental manipulation to elucidate relationships.

Due to the significant impairment in functioning and high mortality rates observed in

anorexia (American Psychological Association, 2013; Arcelus et al., 2011), gaining an

understanding of the factors that contribute to the etiology and maintenance of this disorder is

vital. Theories suggesting that behaviors present in anorexia may serve primarily to regulate

emotions have recently been gaining research support (Espeset et al., 2012; Fox et al., 2013;

Gratz & Roemer, 2004). Research on pro-ana websites and social media sites, a phenomenon

that has proliferated in recent years, has suggested that emotional expression is an important

feature of these sites (Juarascio et al., 2010), along with other purposes for their popularity

(Gavin et al., 2008; Mulveen & Hepworth, 2006; Tong et al., 2013). The present study employed

grounded theory to explore the functions of participation in three previously unexamined social

media sites, Instagram, Twitter, and Tumblr. While an emotion expression function was

supported in this analysis, seven additional themes emerged: defining anorexia as a lifestyle,

identity, or disease; discussion of anorexia as a chronic relapsing and recovering state; defining

what it means to be thin; defining the self as either fat or thin and thus worthless or good;

motivating one's self to continue disordered eating patterns; soliciting positive or negative

attention from others; and the importance of images in the service of all other functions. Few of

these functions were also found on pro-recovery or anti-pro-ana accounts, suggesting the need to

alter pro-recovery sites to fulfill important functions in ways that support and encourage

recovery. These functions also suggest areas of focus for in-person treatment such as the important of social attention and building new problem-solving skills. Through gaining a better understanding of pro-ana social media accounts interventionists may significantly improve both in-person and online resources for those struggling with anorexia.

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Table

Functions Identified from a Grounded Theory Analysis of Pro-Anorexia Social Media Accounts

Theme	Description
Defining anorexia	Discussion of anorexia as a disease, an identity, or a lifestyle choice.
Defining thin	Answer questions such as "How would it look to be thin?" "How would it feel, physically and emotionally, to be thin?" and "How would others react to you if you were thin?"
Describing anorexia as cyclical: Recoverlapsing	Discussion of the chronic and cyclical course of anorexia, of existing somewhere between recovery and relapse.
(Self-)motivation	Discussion of positive physiological and social aspects achieved through starvation, restriction as an act of strength and control, and motivation through self-shaming.
Social attention	Anorexia-related content generated both negative and positive attention from others, both of which may serve to maintain problematic eating patterns.
Venting	Expression of emotions such as sadness, fear, envy, frustration, and happiness.
Self as body	Discussion of body (thin or fat) as identity and linked to self-worth and acceptability by others. Thin is associated with happiness and being accepted, while fat is a sign of worthlessness and negative emotion.
Images	Provided an image to which to compare one's body to determine achievement of goals and rules of self-restriction.