

Pro-anorexics and recovering anorexics differ in their linguistic Internet self-presentation[☆]

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Abstract

Objective: Pro-anorexia has emerged as a new and emotionally charged eating disorder phenomenon. This study explored the linguistic markers of differences in Internet self-presentation of self-identified pro-anorexics who defend anorexia as a lifestyle and self-identified anorexics in recovery. **Method:** One hundred sixty-two Internet message board entries and 56 homepages originating from either pro-anorexics or recovering anorexics were analyzed for linguistic markers of emotional, cognitive, and social functioning, temporal focus, and anorexia-related psychological concerns. **Results:** Across both text sources, pro-anorexics displayed more

positive emotions, less anxiety, a lower degree of cognitive reflection, and lower levels of self-directed attention than did recovering anorexics. Pro-anorexics were also more focused on the present and less on the past. Finally, pro-anorexics were more preoccupied with eating and less with school-related issues and death. **Conclusion:** Linguistically, pro-anorexics and recovering anorexics engage in distinct psychological self-presentation styles. More research is needed to understand the clinical implications of these different linguistic styles.

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Introduction

Pro-anorexia has received widespread media attention as a new and emotionally charged eating disorder phenomenon [1]. Pro-anorexics are individuals who consider anorexia a legitimate alternative lifestyle that they choose to have, rather than an illness that they cannot control [2]. Their websites contain pictures of emaciated models, tips for dieting and how to hide weight loss from parents or doctors, and community manifestoes such as the “Ana Creed”, a list of beliefs that describe what it means to be pro-anorexic (e.g., “I believe in a wholly black and white world, the losing of weight, recrimination for sins, the abnegation of

the body and a life ever fasting”; [2,3]). Although the real prevalence of “pro-ana” sites is impossible to determine, their number has been estimated to exceed 500 [4]. A concern about these sites is their potential to trigger those on the brink of an eating disorder into full-fledged anorexia. Despite media efforts to combat pro-anorexic attitudes, these sites remain popular [2].

The purpose of this study was to explore differences in self-presentation styles of individuals who publicly defend anorexia as a lifestyle and individuals who identify themselves as recovering from anorexia. Methodologically, we attempted to complement traditional questionnaire-based assessments by sampling information directly and non-reactively from pro-anorexics’ main communication platforms, personal homepages, and message boards [5,6]. Two text sources, homepages and message boards, were selected to identify self-presentation styles that generalize across different online media. Pro-anorexics were contrasted against recovering anorexics as a comparison group to

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Table 1
Selected text samples of homepages and message board entries from pro-anorexic and recovering anorexic participants

	Pro-Anorexia	Recovering-Anorexia
Homepages	<p>You can never be too thin...at least to me you can't. People might think it's disgusting, they might think I'm disgusting because of Ana...but what is it that people are always saying? It doesn't matter what other people think, and be happy with who you are. Well Ana is a part of me, and I'm fine with that. Ana makes me happy.</p> <p>I am the thinnest. The thinnest. This is how my day was yesterday. I am 5'4 and 51 pounds. Clinically dying; and if that's what gets me the thinnest, thinner than every other anorexic, then so be it.</p>	<p>I was 10 years old when I began my eating disorder. My life was out of control. Weight was the one thing I could control. And I did it well. My parents encouraged me, my friends admired me and my siblings envied me. Losing weight made me happy.</p> <p>I still have days that I want to give up and curl up and die. But I will not let myself. I am going to win this war if it takes my whole 100 years on this damn planet.</p>
Message board entries	<p>I am going to lose 10–15 pounds by 10/11 ... that's about a month of fasting, 1 hour on treadmill a day. NO LESS than 200 sit ups a day. 100 leg lifts each leg and each low cal food when needing energy. Wish me LUCK. 27 days COUNTING DOWN NOW!</p> <p>Hey everyone! This site is great...but anyway—I'm 5' 3" 108 lbs—I know, a big fat cow! You guys all have so much will power, how do you do it? I want to be 99 lbs and can't seem to lose the weight.</p>	<p>How have I been so lucky?! How long will my good luck last? I've never truly feared death through out six hospitalizations and five years of therapy...others have told me I look like death, or that I will die if I continue, but it's like I feel invisible. I don't know if this will work and I'm not sure if I'll ever get better and more often than not I'm not sure if there is anything "to get better" from, but I don't know if I can trust my own judgment right now either.</p>

better understand how attitudinal factors can affect psychological processes that, in turn, may create barriers to successful anorexia treatment. Recovering anorexics were further considered an appropriate comparison group because they also extensively use homepages and message boards to share their experiences with others.

This study analyzed self-presentation from a linguistic perspective [7]. The psychological study of language use has recently received increasing scientific attention [8]. Word-count-based text analysis approaches have been shown to reliably capture diagnostic information about a wide range of psychological phenomena, including psychiatric disorders [9], suicidal ideations [10], coping with breast and prostate cancer [11,12], psychological responses to a national upheaval [13], and even risk for coronary heart disease [14].

Because of their vehement anorexia-as-a-lifestyle ideology, we expected pro-anorexics, compared with recovering anorexics, to show a more pronounced hedonic focus (references to positive emotions and the present), a higher level of self-absorption (references to self), and a lower level of cognitive reflection (use of cognitive words).

Method

Study design

The study was a 2 (pro-anorexia vs. recovering anorexia) × 2 (homepage vs. message board) factorial design with linguistic markers of basic emotional, cognitive, and social processes, temporal focus, and anorexia-related psychological concerns as dependent variables.

Sampling of homepages and message boards

Pro-anorexia homepages (i.e., personal websites) were retrieved from popular Internet search engines (keywords:

“pro anorexia”, “pro ana”) and by following links from major pro-anorexia sites (e.g., “Anorexic Nation”, “Fat Like Me”, “Bloody Brick Road”). A minimum of 30 words was required for a homepage to be retained in the sample. The final sample consisted of 28 pro-anorexia homepages. The estimated mean age of the site authors was 17.3 years (note: 10 authors did not list their ages). In a similar way, 28 homepages of self-described anorexics in recovery were retrieved (mean age=21.1 years; seven authors did not list their ages). A special effort was made to make the two groups comparable with regard to the authors' sex, age, and ethnicity.

Pro-anorexia and recovering anorexia message boards (i.e., online bulletin boards) were sampled in a similar way via search engines as well as via links from other anorexia sites. The message boards were hosted either by popular providers such as “America Online”, “MSN”, or “Yahoo” or by private persons. To minimize sampling bias, only the first five pertinent entries were taken from each message board. All entries were checked for length (more than 30 words) and authorial intent. The final sample consisted of 82 pro-anorexia and 80 recovering anorexia entries. No age information was available on the authors of these entries.

Table 1 shows selected homepage and message board text samples for both anorexia groups.¹

Data preparation and linguistic analysis

All words contained in the sampled homepages and message board entries were pasted into a text file. These 218 text files were cleaned, spell-checked, and submitted to Linguistic Inquiry and Word Count (LIWC; [15]), an extensively validated word-count based text analysis program [8,10–13]. LIWC characterizes text samples on

¹ The complete list of homepage and message board URLs, as well as the original text samples, is available from the authors.

74 standard grammatical (e.g., first person singular pronouns, articles, prepositions, present tense), psychological (e.g., emotion words, cognitive words, social words), and content (e.g., school, sexuality, eating) dimensions.

From the available 74 LIWC variables, three language dimensions were most relevant for understanding differences in self-presentation styles because they have previously been linked to different coping strategies: (1) emotional processes, such as the use of words referring to positive emotions (e.g., “happy”, “good”) and negative emotions (“hate”, “scared”), particularly anxiety (e.g., “afraid”, “scared”; [11–13]); (2) cognitive processes, such as the use of words that refer to cognitive mechanisms (e.g., “cause”, “know”), particularly insight into causal processes (i.e., insight words; e.g., “cause”, “realize”; [11–13]); (3) social processes, particularly words that hint at a general social awareness (i.e., social words; e.g., “talk”, “you”) versus self-awareness (i.e., first person singular pronouns; e.g., “I”, “me”, “my”; [10,13,14]). The study also included an analysis of temporal focus as indicated by references to the past (i.e., use of past tense verbs) and the present (i.e., use of present tense verbs). Finally, three content categories were included to tap into the prevalence of anorexia-related psychological concerns: references to eating (e.g., “meal”, “diet”), references to school (“exam”, “study”), and references to death (“dead”, “coffin”).

Results

Table 2 summarizes the results from a series of univariate two-way analyses of variance for the selected LIWC variables. All effects are based on 1 and 214 degrees of freedom.

The analyses of the linguistic indicators of emotional processes indicated that compared with recovering anorexics, pro-anorexics used more positive emotional words in both their homepages as well as their message boards. Pro-anorexics also used anxiety words at a markedly lower rate than recovering anorexics. Furthermore, as predicted, across both text sources, pro-anorexics used significantly fewer cognitive mechanism words, and specifically insight words, than recovering anorexics did. Contrary to our hypotheses, pro-anorexics made not more but fewer first person singular self-references than did recovering anorexics, indicating lower levels of self-focused attention. Consistent with the predicted focus on the here and now, both homepages and message boards of pro-anorexics contained more present tense verbs and fewer past tense verbs than did those of recovering anorexics. Finally, with regard to the prevalence of anorexia-related psychological concerns, pro-anorexics, compared with recovering anorexics, showed a higher degree of preoccupation with eating and made fewer references to school- and death-related issues.

Table 2
Differences in the language use of pro-anorexics and recovering anorexics on homepages and message boards

LIWC categories	Examples	Homepages		Message boards		ANOVA effects		
		Pro-anorexia (n=28) M (S.D.)	Rec-anorexia (n=28) M (S.D.)	Pro-anorexia (n=82) M (S.D.)	Rec-anorexia (n=80) M (S.D.)	A η_p^2	T η_p^2	A×T η_p^2
Emotional processes								
Positive emotion words	Happy, good	3.0 (1.7)	2.9 (1.5)	4.0 (2.8)	2.9 (1.6)	.02**		
Negative emotion words	Hate, scared	1.7 (1.1)	2.1 (0.8)	2.1 (2.0)	2.3 (1.4)			
Anxiety words	Afraid, scared	0.3 (0.5)	0.4 (0.6)	0.1 (0.4)	0.6 (0.7)	.06***		
Cognitive processes								
Cognitive mechanisms	Cause, know	6.8 (2.3)	8.2 (2.2)	8.0 (3.0)	8.2 (2.8)	.02**		
Insight words	Know, realize	1.7 (1.5)	2.7 (1.0)	2.1 (1.7)	2.6 (1.5)	.04***		
Social processes								
Social words	Talk, you	8.2 (4.4)	7.7 (3.4)	8.3 (4.9)	7.5 (3.4)			
First person singular pronouns	I, me, my	6.4 (4.6)	9.4 (4.0)	9.7 (4.4)	11.6 (3.8)	.06***	.08***	
Temporal focus								
Present tense verbs	Is, go	13.0 (2.2)	11.1 (4.3)	15.7 (4.3)	14.6 (5.0)	.02**	.08***	
Past tense verbs	Was, went	1.7 (1.7)	5.0 (3.2)	2.6 (2.6)	3.7 (2.5)	.13***		.03***
Psychological concerns								
Eating	Meal, diet	3.1 (2.0)	2.2 (1.5)	2.4 (2.5)	1.8 (1.4)	.03***	.01*	
School	Exam, study	0.3 (0.4)	0.4 (0.4)	0.1 (0.4)	0.5 (0.7)	.04***		
Death	Dead, coffin	0.0 (0.1)	0.1 (0.2)	0.1 (0.3)	0.2 (0.4)	.02**		

Means and standard deviations refer to percentage of total words within each text sample. Results are based on univariate two-way ANOVAs ($df=1,214$). Rec-Anorexia=recovering anorexia; A=main effect for anorexia group; T=main effect for text source; A×T=two-way interaction; η_p^2 =partial eta squared (sums of squares based effect size estimate that indicates what proportion of the effect and error variance is attributable to the effect).

* $P < .10$ (two tailed).

** $P < .05$ (two tailed).

*** $P < .01$ (two tailed).

Discussion and conclusion

The purpose of this study was to explore pro-anorexia as a new, highly emotional, and publicly controversial phenomenon. The findings revealed that pro-anorexics and recovering anorexics differed reliably in the language that they used in their homepages and on message boards. Specifically, compared with recovering anorexics, the word use of pro-anorexics indicated a more pronounced hedonic focus on positive emotions and the here and now, reduced level of cognitive processing, and a lower degree of self-preoccupation.

A similar language use pattern was recently found among users of an online journal website in the aftermath of September 11, 2001 [13]. Compared with a pre-9/11 baseline, participants evidenced slightly elevated levels of emotional positivity, reduced levels of cognitive processing, and reduced levels of self-preoccupation in the months after the attacks. This raises the possibility that pro-anorexics' language use hints at a coping strategy aimed at stabilizing them emotionally. This stabilization, then, may allow pro-anorexics to sustain their immunity to psychological treatment.

Methodologically, this study used an innovative data collection strategy, the unobtrusive sampling of language from the Internet. A limitation of this strategy is that only restricted information on the participants could be gathered [16,17]. Furthermore, although the text samples originated from individuals who publicly presented themselves as pro-anorexic or recovering anorexic, it is not clear to what extent the participants actually met clinical DSM criteria. Finally, the absence of precise definitions of pro-anorexia and recovering anorexia and the lack of a healthy control group prevent that strong conclusions can be drawn from the data. Yet, as one of the first empirical investigations into pro-anorexia, this study draws scientific attention to this new, clinically relevant social phenomenon. With its word-use approach, the study provided a linguistic characterization of pro-anorexics' Internet self-presentation. This characterization suggests that pro-anorexics may use a coping strategy that stabilizes them emotionally and allows them to experience a sense of control over their illness [2]. Future research needs to investigate the effects that pro-anorexia homepages and message boards exert on risk-populations, as well as the implications of pro-anorexics'

self-presentation styles for the early detection and treatment of anorexia.

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