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Craig Alder April 4, 2019

Depression and Anxiety Across the *Times*

By

Craig Alder

Master of Arts

Sociology

Ellen L. Idler

Advisor

Weihua An

Committee member

Roberto Franzosi

Committee member

Accepted:

_____

Lisa A. Tedesco, Ph.D.
Dean of the James T. Laney School of Graduate Studies

_____

Date

Depression and Anxiety Across the *Times*

By

Craig Alder
M.S., Johns Hopkins, 2014.

Advisor: Ellen L. Idler, PhD

An abstract of
A thesis submitted to the Faculty of the James T. Laney School of Graduate Studies of Emory University in partial fulfillment of the requirements for the degree of
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Abstract

Depression and Anxiety Across the *Times*
By Craig Alder

Using a corpus of all the articles from 1980 to 2018 in the *New York Times* that mention clinical anxiety or depression, I analyze 1) whether the *Times* reflects the increasing research and clinical trends in anxiety and depression in the volume of their coverage, 2) whether they topically represent important events from previous literature, and 3) whether they specifically uncover the importance of the Diagnostic and Statistical Manual of Mental Disorders, Third Edition (DSM-III) in shaping the subsequent landscape for clinical depression and anxiety. I find that they do increase coverage and represent important topics, but they do not report on the importance of the DSM-III, providing very little coverage of the DSM until the fifth edition. I complete the analysis using a combination of automated computer techniques such as word counts, sentence parsing, and topic modeling. I also hand code articles that mention the DSM and conduct close readings of select articles.

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INTRODUCTION

January 24 of 1983, the *New York Times* published its first article to use the term Generalized Anxiety Disorder (GAD), an article in the Style section titled "A New Look at Anxiety's Many Faces." It quoted a researcher that said, "We are just beginning to study generalized anxiety, and it may be a hodgepodge of unspecified causes." The quotation has little explanation, including no indication or reporting on why researchers are just beginning to study it. In fact, the reason is that like many disorders commonly known to the public today, the term did not exist until the publication of the Diagnostic and Statistical Manual in 1980. However, this article approached the disorder with implicit assumptions about, and trust in, whatever scientific process produced it.

One important perspective offered by the sociology of mental health concerns the study of how definitions and boundaries of mental health are cultural products. There is considerable research by Horwitz and colleagues (Horwitz and Wakefield 2007; Horwitz 2012) that describes the successful efforts from one corner of psychiatry to dominate the field by imposing priority on scientific reliability rather than etiological validity in the Diagnostic and Statistical Manual III (DSM-III). This contributed to a dramatic rise in diagnoses, especially of depressive and anxiety disorders. While depression was a relatively obscure disorder before 1980 (Horwitz and Wakefield 2007), many public health officials and researchers view it as a public health crisis, with researchers predicting it will be the leading cause of disability in developed countries like the United States by the year 2020 (Mathers and Loncar 2006). Regardless, the broader medical community and pharmaceutical companies have had a straightforward financial incentive to support a rise in these diagnoses.

With clinical depression and anxiety built into the social fabric of the 21st century, it is worth considering how cultural institutions beyond psychiatry have contributed or responded to changing definitions and applications. Other institutional topics that researchers have studied include deinstitutionalization (Schutt 2016; Scheid and Brown 2009), pharmaceutical companies (Conrad 2008; Moynihan and Cassels 2005), access to healthcare (Aday & Andersen 1974), medical record keeping (Aday & Andersen 1974), insurance companies (Mechanic and McAlpine 2010), gender and sexuality politics (Tiefer 2006; Bayer 1987), and the rise of unique disorders previously unknown, such as PTSD (Scott 1990). In this paper, I explore yet another cultural institution, the newspaper media, via a case study of the *Times'* coverage of clinical depression and anxiety from 1980 to 2017. I utilize automated text analysis techniques to examine 1) whether the rise of diagnoses in depression and anxiety are mirrored by a rise in related newspaper coverage, 2) whether the paper touches on a number of important events and topics in that coverage, and 3) whether the paper specifically tracks the influence of the DSM-III and psychiatry on these events.

HISTORICAL BACKGROUND

For the context of this paper and its data, I divide the timeline from 1980 to 2017 into four stages that reflect the current literature and important public events -- each overlapping with the others to some degree -- from 1980 to 2017: 1) the establishment of DSM-III diagnostics and practices, 2) a period of trust in psychiatry, 3) a period of moderate backlash, and 4) a period of scientific expansion. A review of the literature suggests six topics that can be tracked over this time period: the DSM, therapy services, health insurance and industry practices, prescription

drugs, research, and deinstitutionalization. Figure 1 provides a graphical representation of this historical context.

<insert Figure 1>

The first period constitutes much of the 1980s. The publication of the DSM-III at the beginning of the decade was the foundational event. Prior to this, psychiatry had been a loosely organized practice built around the more theory-driven psychodynamic approach. Psychoanalysts explored patients' pasts as an essential component of addressing neuroses (Strand 2011). The DSM-1 and DSM-II were interpreted inconsistently by these practitioners, leading in the 1970s to an anti-psychiatry movement that successfully drew into question the validity of psychiatric treatment (Goffman 1961; Rosenhan 1973). Led by a fringe group of researchers from Washington University devoted to changing the prevailing paradigm and legitimating the field of psychiatry in the process, the architects of the DSM-III created a diagnostic standard based on symptoms: the disorders could reliably be measured, studied, and applied clinically. The underlying focus of psychodynamics on the whatness and validity of mental illness would recede into the background. Because psychoanalysts did not place significant importance on the DSM-I and DSM-II, the eager team from Washington University largely went unnoticed as they began forming the new DSM. It was only in the process of ratification that psychoanalysts realized a clandestine operation was underway to transform psychiatry, and it was too late to make significant changes to the manual (Horwitz and Wakefield 2007; Horwitz 2012).

Epidemiologists soon adopted the DSM-III criteria to study the prevalence of mental disorders. In one of the first of these studies, Robins et al. (1984) found that across three cities in the U.S. the lifetime prevalence of any DSM-III disorder was about 30% or higher, with major

depression affecting about 4% or higher, and phobias at least double that, a ready resource for public health professionals and officials. Researchers identified depressive and anxiety disorders as the most common type of diagnoses, not neuroses. At the same time, therapeutic treatment was shifting to cognitive approaches pioneered by Aaron Beck (Beck 1979). Cognitive Behavioral Therapy (CBT) focused on treating symptoms rather than etiology, pairing well with the new DSM. It has remained a staple of therapy since. Health insurance companies also adopted the DSM, using the disorder criteria for billing (Mayes and Horwitz 2005). Private insurance companies began implementing managed care (Scheid 2000). Pharmaceuticals also adopted symptom-focused DSM criteria for testing drugs, building off the success they were already having with anxiety medications like alprazolam (Galatzer-Levy and Galatzer-Levy 2007). Furthermore, Deinstitutionalization, the process of closing down or reducing the services of mental hospitals, continued, as did concerns about whether those individuals were simply being pushed into other institutions like nursing homes, prisons, or homelessness (Hiday et al. 2009; Goldman & Morrissey 1985). As psychiatrists moved their offices from hospitals to clinics, the vast population beyond severe mental illness became a logical direction for making money, and the expansion of disorders in the DSM validated such treatment (Scheid and Brown 2009). In sum, the 1980s, led by a new DSM, defined a rational approach to mental health that was more reliable and efficient than in the past.

In the 1990s, psychiatry firmly established its professional role. The DSM-IV, published in 1994, expanded the number of disorders from the DSM-III, maintaining the symptom-criteria paradigm and making very few changes to already existing disorders (Frances 2013). Continued research by epidemiologists alerted the public to a high prevalence of mental disorders (Kessler

et al. 2005). The population had newfound hope in treatments for mental disorders, and they began to perceive broader treatment as necessary for a healthy society. Therapists expanded the cognitive behavioral approach, developing adaptations such as Dialectical Behavior Therapy (Linehan 1987). Government insurance programs began adopting managed care, utilizing the DSM for billing as medical care was becoming an evermore economic venture (Scheid and Brown 2009). The first commercial craze for antidepressants, selective serotonin reuptake inhibitors (SSRIs), began in the late 1980s and flourished in the 1990s. The prevalence of antidepressant use from 1988 to 1994 was 2.5%, compared to 8.1% during 1999-2002 (Paulose-Ram et al. 2007). Family practitioners became a go to for these prescriptions, increasing access and ease (Pirraglia 2003). Finally, in 1997, the Food and Drug Administration established new guidelines that substantially increased direct-to-consumer advertising (Donohue 2006), tying the inertia of the decade together.

The third shift came in the form of at least superficial pushback and concern. New research that showed antidepressants could increase suicidality for some consumers led to a federally required black box warning label for antidepressants in 2004. In the wake of this scare, the continual increase of antidepressant prescriptions that had gone on for some years leveled out for the second half of the decade (Kantor et al. 2015). Adding to this concern, the concurrent use of the anxiety drug alprazolam with opiates led to a significant number of overdose deaths (Jones et al. 2010). Dovetailing with these events, the APA began working on a fifth version of the DSM, and there was a heated debate about the medicalization of mental illness. Architects of the DSM-III and DSM-IV publicly raised concerns about whether the manual was taking normal emotions like fear and sadness and transforming them unduly into illnesses (Frances 2013). The

National Institute of Mental Health (NIMH) director publicly challenged the DSM-5 in a blog post as the APA prepared to released it, declaring the NIMH would focus research on symptoms rather than disorders specific to the DSM criteria (Insel 2013).

During the first decade of the 2000s, when the medical model for mental health experienced challenges, practitioners and scientists were naturally developing a number of new perspectives on how to best treat mental disorders and promote mental health that became more mainstream in the 2010s. Eastern mindfulness, already present in therapies such as Acceptance and Commitment Therapy and DBT, gained broader traction (Hoffman et al. 2010; Fjorback et al. 2011). Positive psychology also provided the public a different approach to mental health, and a "happiness industry" developed alongside (Davies 2015). The finished human genome project also brought renewed interest in the role of genetics in mental disorders. Researchers, practitioners, and the public saw a complex interaction of different aspects of the human experience, and that a number of targeted treatments and tools could improve and address mental health. However, the medical model continued as the dominant paradigm, and the number of antidepressant medications began increasing again (Pratt, Brody, and Gu 2017).

NEWSPAPER CONTEXT

In this paper, I unpack the narrative patterns offered by *The New York Times* in their coverage of mental illness and mental health during the previously reviewed decades. The *Times* is the largest combined print-digital circulation in the U.S. and has won more Pulitzer prizes than any other newspaper ("Awards and Recognition"). Historians commonly use the *Times* as a significant source for important events and measures of public opinion (Martin and Hansen 1998). Additionally, the *Times* has completed an extensive digitization project that enables

computerized textual analysis conducive to answering the questions in this project. Few other papers go back as far as the *Times* -- June of 1980 -- with complete transcripts of each daily publication.

More broadly, newspapers serve a vital role in society. They can portray unique frames of information as they sustain coverage on particular topics, tap into public ideology, and represent opinion leaders (DiMaggio, Nag, and Blei 2013). They can also perpetuate myths or influence readers as they overreport especially unusual and intense events, focus on events involving notorious individuals, respond to their perceptions of what their audience wants, and stop covering issues when their readers become fatigued by repetition (Myers and Caniglia 2004); for example, newspapers perpetuated myths during hurricane Katrina by portraying looting as rampant (Tierney, Bevc, and Kuligowski 2006). Newspapers may also impact public opinion especially if the public is already interested in a given topic (Eyck 2005) or coverage is sustained (Sampei and Usui 2009), perhaps tapping into existing schemata and biasing people towards a particular framing of an issue (Iyengar and Kinder 1987). Discourse in newspapers can shape perceptions of groups of people in narratives by selecting particular actors within a range of possible actors in a story, characterizing these actors with descriptive language, positioning them in subject-verb-object triplets, and using passive versus active nominalization (Franzosi 2012).

RESEARCH QUESTIONS

I use Moretti's automated "distant reading" approach and extensions of such computerized approaches offered by a number of recent scholars to explore the following research questions:

1. There is clear evidence that after 1980 medical professionals began to diagnose and treat anxiety and depression at an accelerating pace. Does the *Times* match that pace with increased coverage?
2. The four decades since then have been characterized by a number of historical and institutional changes. Does the *Times* cover the DSM, therapy, health insurance and industry practices, prescription drugs, research, and deinstitutionalization?
3. In their coverage, does the *Times* dissect the impact of the DSM and the authority of psychiatry as an institution?

Ultimately, much of automated textual analyses are inductive, so the answers to these fairly broad questions will be shaped or limited by the text. Such an approach can be especially helpful in theorizing and proposing new directions in research (see, for example, DiMaggio and Blei 2013).

DATA AND METHODS

Using Nexis Uni ®, I conducted a search from 1980, the earliest digitized year of *Times* articles, to 2017, via the following terms: *mental health, mental illness,* any combination of *mental health/illness or mentally ill/healthy, mental/psychological/emotional/psychiatric/mood disorder/disability/distress/disturbance, mental well-being, mental wellness or mentally well, behavioral health/disorder, MDD, depressive disorder, major depression, anxiety disorder*. I included wildcards to account for both singular and plural uses of these terms. This yielded a result of approximately 30,000 news articles. From there, I narrowed the corpus down to the 5,616 articles that mention *depression* or *anxiety*. By taking the first step to select all articles with terms related to mental health generally or depression and anxiety disorders specifically, I

weeded out articles that might mention "depression" or "anxiety," but where the terms may refer to events like the Great Depression, or the use of "anxious" as a synonym for "worried." Admittedly, this leaves out a likely substantial number of articles that refer to depression or anxiety implicitly as their disordered forms without ever using disordered or mental health language.

To analyze the corpus, I used the statistical program R and a number of open-source packages including dplyr (Wickham and Francois 2015) and tidytext (Silge, Robinson, and Hester 2016) for counting terms and trends, spaCy (Honnibal and Johnson 2015) for parsing sentences, mallet for topic modeling (Mimno 2013), and ggplot2 (Wickham 2016) for graphing trends.

I also read and hand coded each article that mentioned the Diagnostic and Statistical Manual (n = 1256). At various stages, I used information from the statistical analysis to select articles and excerpts to read more closely. As done elsewhere (see, for example, Mohr 2013 and Franzosi 2012), I explain the automated methodology more as I present the findings.

RESULTS

Coverage. To analyze whether the *Times*' coverage matches the increased scientific and other attention to clinical depression and anxiety, I first graphed the number of articles in the corpus over time. This does not illustrate density, so the results show whether the articles that mention depression or anxiety at all are increasing. Figure 2 shows a clear increase from about 100 articles a year in the early 1980s to well over 200 articles per year in the 2010s. This holds true whether treated as a raw count or standardized by the number of total articles the *Times* published in a given year.

<insert Figure 2>

Google has compiled an extensive repository of books, and they have created a webpage for what they call Google N-Grams. Anyone can search for specific terms. The result is a graph representing the percentage of the terms in the repository that are made up of the search term. As Figure 3 demonstrates, MDD is almost nonexistent until 1980, whereas GAD was used slightly more, but also trends up over time. A brief search of scientific literature from the 1970s shows that GAD was a developing idea leading into the DSM-III. The figure generally supports the expectation that GAD and MDD are born from the DSM-III and over time become common reference points.

<insert Figure 3>

I also graphed the number of articles per year where depression or anxiety terms are used. For MDD, I searched "major depress_" or "MDD," and for GAD I searched "Generalized Anxiety" or "GAD." After ruling out all articles that specify MDD or GAD, I then counted all articles that use the terms depression or anxiety that are part of disorder names, I searched "anxi_" for non-disorder anxiety. Similarly for non-disorder depression, I ruled out when it is used in part of a name, then selected by "depress_." Finally, I included the general term "mental disorder_." The plot uses loess regression and shows that the full clinical term for GAD is almost never used, while MDD is used sparingly. The mean value for MDD usage is 11.8 per year with a maximum of 26 in 2015. The mean value for GAD is .5 with a maximum of 4 in 2014. In contrast, non-disorder anxiety and depression articles steadily increase over time from about 50 to 175 articles per year for depression, and 25 to 125 for anxiety.

<insert Figure 4>

Topical context. To determine whether more articles per year wrote about depression and anxiety beyond simply mentioning them, I returned to Figure 1 and applied a technique called topic modeling. DiMaggio and Blei (2013) provide a detailed explanation for how topic modeling works in their analysis of newspaper coverage of the National Endowment for the Arts. The basic premise behind topic modeling is that a corpus of text -- that is, all the text being analyzed -- is made up of a limited number of unknown topics, the number being set prior by researchers. Topics consist of a distribution of words that are likely to occur together, with the most important words weighted more heavily for each topic. These weightings are determined via a bayesian technique called Latent Dirichlet Allocation. Accordingly, within each document, each word is assigned to one of the topics. In this text, I use a 31-topic model.

To illustrate further how topic modeling works, consider two topics -- out of 31 total -- from this paper's corpus. Table 1 shows the names I assigned to the topics after reviewing the top weighted words, as well as the paragraph with the greatest percentage of words assigned to the topic, the title of the article it is drawn from, and the date (I reviewed the top 8 paragraphs to get a clear understanding of the words in each topic are used).

< Insert Table 1>

The topic model related well to all the information reviewed in Figure 1 from the literature review, demonstrating that the *Times* did comprehensively cover the broader topics related to depression and anxiety since 1980. In Figure 5, I have replaced the names of the topics from the literature review with the most relevant topics from the topic model. These topics include the following: diagnostic language for depression and other disorders, therapy, healthcare insurance, mental disorder research, prescription medicine, and intensive psychiatric

care. I graphed two loess lines for each topic. One represents the number of articles each year wherein 5% to 10% of the words are assigned to the given topic. The other represents the number of articles wherein 20% or more of the words are assigned to the given topic. This provides a rough approximation for how many articles are lightly touching on the given topic compared to substantively covering it.

<insert Figure 5>

The number of articles using diagnostic language steadily increases over time, especially for those articles that use the language briefly or lightly. Documents utilizing the therapy and mental disorder research topics steadily increases over time, again especially for those articles that use the language briefly or lightly. Insurance coverage reaches its maximum and levels out in the 1990s. The prescription medicine topic peaks in the early 2000s, with the articles that have 20% or more of the words assigned to the topic overtaking those that have only 5% to 10%. The denser articles covering intensive psychiatric care decrease over time, while the articles with 5% to 10% of the words assigned increase over time.

To understand a little more context, I also analyzed whether coverage is changing by section. Collating the sections from 1980 to 2017 required careful work, at times ensuring sections that only existed at certain time points fit into the final section labels. Figure 6 is a screenshot of the bottom of the homepage of the *Times*. It has the paper organized into the following broader sections: News, Opinion, Arts, Living, and More. Under each broader section, there are a number of more specific sections as shown. I created a variable called Section wherein I assigned each article a section label. First, I used the broader sections listed above. To better zero in on how coverage has changed across the paper, I then assigned a number of the

more specific subsections, including Science, Business, and Sports from the News section. Zeroing in on Business and Sports shows how sections not tied closely to clinical depression or anxiety have incorporated them more or less over time. I also combined Health and Wellness from the Living section with a subsection from the Science section that also covered health and wellness into a single label of health. Thus, variables assigned to Science are articles that are not from the health subsection, and likewise for Living.

<insert Figure 6>

Figure 7 shows a graph of the number of articles assigned to each section per year across time, except for the main News section. Very few articles come from Sports or Business, but they do appear to increase over time. The Living section -- where frequently interest pieces are written -- increases somewhat over time, especially in the 2000s, matching the same pattern as the Health section. The Science section is static, while the clearest increases come from the Opinion and Arts sections, especially from 2010 on. The trends in Figure 8 shows the main News section. In the 1980s under 50 articles each year are assigned to the section, while by the end of the 1990s it reaches about 75 articles each year. This holds true, with some variation, to 2017.

<insert Figure 7>

<insert Figure 8>

The DSM and psychiatric authority. Figure shows the number of articles that mention the APA each year. There appears to be a slight increase over time from about 4 articles a year in the 1980s to about 8 per year by 2010. Of more interest, the years 1995, 2001, and 2014 have abnormally low with 2, 4, and 3 respectively. 2006, 2012, and 2013 have abnormally high numbers at 13, 15, and 13 respectively.

<insert Figure 9>

I isolated each word that begins with “psychiatr” and selected all those that are tagged by spaCy as nominal subjects, i.e. the actors in a sentence. Figure 10 compares the number of yearly nominal subject references to “psychiatrist,” “psychiatrists”, “psychiatry”, and “psychiatric.” There is no clear direction, but there are a number of peaks and dips from year to year. The mean values of each yearly count is 33.6 for "psychiatrist,” .2 for "psychiatrists," 3.6 for "psychiatry," and 1.9 for "psychiatric."

<insert Figure 10>

I then identified the verb acted out by the “psychiatr” subjects. Table 2 shows the top verbs for the different forms of “psychiatrist.” The few times “Psychiatrists” is used, the verbs are administrative in nature. “Psychiatric,” “psychiatrist,” and “psychiatry” all have saying and being as top verbs, with “psychiatry” being the only one to have being occur more than saying. “Psychiatric” has more negative verbs such as challenging, complaining, destroying, and excluding. “Psychiatry” has more existential verbs such as having, seeming, and becoming. “Psychiatrist” has more opinion-oriented verbs such as testifying, telling, believing, describing, and suggesting.

<insert Table 2>

To understand how the *Times* covered the DSM, I isolated each article that mentioned any edition of the DSM. I read each article and coded variables for whether the article uses the DSM to describe clinical anxiety, depression, or another disorder; whether it questions the DSM's approach to clinical anxiety, depression, or another disorder; and whether the DSM is not substantively discussed, but rather simply in passing. Figure 11 is a bar chart illustrating the

number of articles assigned a value of true for meeting these criteria for each given variable. Over 82 articles describe disorders that are not clinical depression or anxiety, while 55 challenge such articles. On the other hand, 21 articles for depression and 15 for anxiety describe the disorders, while 15 for depression and 12 for anxiety challenge the DSM. 90 articles simply reference the DSM in passing, and 37 challenge the DSM globally.

<insert Figure 11>

DISCUSSION

The corpus in this analysis provides a comprehensive picture of coverage for clinical anxiety and depression in the *Times.* As expected, the volume of articles increases from 1980 to 2018. This reflects the increasing trends in science and society related at least to the 6 topics from the literature review: the expanding of the DSM, changing practices in therapy, health insurance and industry practices, high increases in prescription drugs, prolific research, and deinstitutionalization.

The topic model accurately identified increases in topics found in the text compared to the topics identified in the literature review. Importantly, as Figure 5 shows, language associated with the depressive diagnostic topic shows up in more articles over time, especially those that use such language in just 5% to 10% of its words. This makes sense, given that broader coverage of depression and anxiety is also increasing, but the gap between the articles with 20% or greater content coming from the depression topic compared to those with between 5% and 10% is much larger than for the other topics. This shows that the *Times* is increasingly apt or able to use this language in a variety of contexts, or is increasing their coverage of topics that are related to

mental health. Either way, clinical depression is a more readily available frame for discourse than ever since at least 1980.

The section trends show that most sections increase in representation, especially pre- compared to post-2000. One of the more interesting sections that increases is the Arts section. This could represent both an increase in interest from *Times* reporters in artistic works that incorporate clinical depression or anxiety, as well as a higher volume of related art and entertainment in society. For example, a review of an October Saturday Night Live episode touched on a cast member's "recent disclosure that he had been given a diagnosis of borderline personality disorder, which he described as a form of depression." This coverage could represent an increased willingness for public figures to discuss mental disorders, as well as an increased likelihood for the *Times* to report on it.

The DSM and the APA. I explored whether the *Times* was able to effectively cover the importance of psychiatry and the APA, especially via iterations of the DSM. Most of the references to psychiatry specifically are about sole psychiatrists. The small number of references to the APA -- with the exception being an increase during the DSM-5 creation years -- illustrates where the *Times* is not focusing their attention. Looking at psychiatry words not necessarily attached to the APA, psychiatrists do not tend to act as a group. When "psychiatric" and "psychiatry" are used as nominal subjects, they often act in deficient or challenging ways, compared to verbs attached to "psychiatrist" that are clearly authoritative in nature. Consider the following paragraph that uses the term "psychiatry," taken from a first-person narrative in the Living section:

> "Over the years, I've talked to clinicians about why the self is rarely mentioned in treating patients who suffer from mental illnesses that damage their sense of who they are. If anything, it seems

> that psychiatry is moving away from a model in which the self could be discussed. For many psychiatrists, mental disorders are medical problems to be treated with medications, and a patient's crisis of self is not very likely to come up in a 15-minute session with a psychopharmacologist."

And another article quotes a scientist who says, “Psychiatry is still pretty much in the dark ages.” Indeed, when psychiatry is a nominal subject, it is often treated as existentially problematic. In contrast, one article reports on a woman whose “psychiatrist told her that she should be admitted to a special unit for trauma victims -- but her health plan said otherwise.” It is a passing example of how psychiatrists as individuals are perfunctory components of depression and anxiety discourse. The institution is further removed from the reader’s eye.

References to the DSM are similarly scant, and they tend to be about non depressive or anxiety disorders. For example, some of the titles of the articles that challenge the DSM include:

- "Ideas and Trends; Psychiatrists Versus Feminists," "Smoking. Is it a Habit or Is It Genetic?" (1986-07-06)
- "Fervid Debate on Gambling: Disease or Moral Weakness?" (1992-11-24)
- "Ideas & Trends; Dissociative Fugue and Other Ailments" (1997-09-28)
- "Making a Plus of the Deficit in A.D.D." (2000-10-31)
- "How Can You Distinguish A Budding Pedophile From A Kid With Real Boundary Problems?" (2007-07-22)
- "Sex and the Single Drug" (2010-06-27)

Most articles that are critical of the portrayal of clinical depression come from 2009 to 2012 and are related to the creation of the DSM-5. For example, one article, published in 2012, is titled “Grief Could Join List of Disorders.” It details the concerns of prominent psychiatrists about the way clinical depression could be redefined in the DSM-5.

Another pattern that showed up in close readings of the corpus is that often times when depression and anxiety are referenced, articles will say what it *is*. There is an implicit assumption that these disorders are metaphysically static conditions. In February of 1981 the New York Times published one of its first stories that referenced the one-year old Diagnostic and Statistical Manual-III (DSM-III). The article covered an academic discussion among psychiatrists that previewed what researchers have documented since: the DSM-III would shift both research and the public conscious from more severe mental disorders to more mild mood and anxiety disorders. The coverage includes analysis by researchers regarding a number of figures in popular literature that told their stories as people with schizophrenia, when in fact their symptoms better fit criteria for depressive disorders. As the Times put it, implying a trust in the field of psychiatry, "research reveals" schizophrenia is often misdiagnosed. In reality, the changing research landscape was largely driven by the new DSM-III. Scientists in this corpus are discovering and uncovering, not creating and defining. The low number of references to the full disorder names, MDD or GAD, as well as the low number of references to the DSM and the APA reveal how taken for granted the construction of these disorders are. Especially considering how both anxiety and depression are common synonyms for worry/fear and sadness respectively, the rare attribution to the origin of their meanings hides much of the substance of the contemporary experience of depression and anxiety. The ever-expanding coverage of depression and anxiety from the *Times* then, may be likened to the common analogy of portraying the tip of the iceberg. In reality, research has shown that the shift from 1980 to now has been extraordinary, and that understanding the influence of the DSM-III and the role of psychiatry as an authoritative institution is an indispensable component of the story.

CONCLUSION

As measured in this corpus, the *Times* did cover extensively a number of relevant issues related to depression and anxiety. They were, however, unable to adequately cover the role of the DSM-III in 1980, and its subsequent editions. The Science section -- new to the *Times* in 1978 -- would seem an ideal candidate for this task. In reaction to events like the Three Mile Island incident, science journalists became motivated to join the 'Watchdog Age' of journalism in the 1980s, and the *Times* led the way in terms of science reporting (Rensberger 2009). The development of the DSM-III approach to mental disorders, however, stayed under the radar. It took until the publication of the DSM-5, when a number of public critics spoke out, for the *Times* to do much reporting on the problems of the DSM related to depression or anxiety.

Hindsight makes the narrative simple: the *Times* could have asked more probing questions of perhaps the most important governing authority on mental health to best understand their other coverage related to depression and anxiety. Practically, in the demands of the media world, such in-depth reporting may be hard to systematically produce. Future work can uncover theoretical mechanisms, especially via comparative analyses, to help explain some of the trends in this paper and shape suggestions for journalists. Some relevant questions include:

- Do the trends in coverage of MDD or GAD match trends in the use of other mental disorders that would affect less of the public, such as schizophrenia?
- Do newspapers have a pattern of failing to uncover important events and decisions made by governing professional associations?

- How quickly does it take for a population to accept authoritative directives or standards when the changes are as significant as those from the DSM-II to the DSM-III?
- How similar are people's interpretations of anxiety and depression terms when reading the same newspaper articles? Does it correlate with exposure to mental health professionals?

There are also a number of opportunities to use additional natural language processing techniques. Wordnet is a tool that helps identify cognitive synonyms, identifying common concepts tied to differing words. This could help explain, for example, some of the differences in the use of verbs in the subject-verb analysis of psychiatry terms. Structural topic modeling could help identify more specific changes in topics, including variation in which specific words hold more or less weight in a topic over time. Network analysis and deep learning sentiment analysis are two other tools that could be especially useful for understanding the connections between specific words with each other, and the general positive or negative tone associated given terms.

There are a number of limitations in this paper that future research can address. There are certainly a large portion of articles missing from this corpus that likely mention anxiety or depression without using any of the mental disorder language I used to filter articles into the corpus. Having such data would allow for supplementing Horwitz's work on the pathologization of normal emotions. Perhaps a newspaper might be using the term "depression" to refer to a number of situations that formerly were referred to using emotion-based language. Another limitation is that the corpus comes from a single newspaper, one with a specific readership.

Future research could compare discourse among newspapers, including newspapers produced by and for various marginalized groups.

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TABLES AND GRAPHS

Table 1. An example of two topics extracted from the topic model. I assigned each a name based on the top weighted words and paragraphs with the densest concentration of words from the topic.

Topic Name	Top weighted words	Paragraph with most words assigned to topic
Healthcare insurance	0.025 health care insurance mental cost plan coverage pay company state medicaid benefit medical cover service	Title: “Administration Rethinking Mental-Health Coverage” Date: 1993-06-10 Paragraph: But, they said, if the state money is not available, the premium for comprehensive mental health services would more than double, to $700 a year, and the overall premium would be $3,400.
Sports coverage	0.014 player game team play coach sport williams athlete season run win football league career hit	Title: “For Troubled Wright, N.B.A. Is a Tall Task” Date: 1994-10-23 Paragraph: "He weighs 300 pounds, then two or three days later he weighs 312," said Jerry Sloan, Utah's coach, when asked about Wright. "That's not good for him, and that's certainly not good for a basketball player. Does he have a chance to get better? Everybody has a chance. But nobody can do it for you. You have to do it yourself."

Table 2. For each form of the nominal subject "psychiatry," most common verbs associated. Parentheses include the count for each verb. N = 1350.

Nsubj	Top verbs for nsubj (N)
Psychiatric	Say (18), be (12), challenge (4), write (3), complain (2), destroy (2), exclude (2), send (2), acknowledge (1), add (1)
Psychiatry	Be (30), say (24), have (4), seem (4), argue (3), become (3), go (3), need (3), attract (2), believe (2)
Psychiatrists	Note (2), estimate (1), meet (1), report (1), say (1)
Psychiatrist	Say (297), be (160), have (33), testify (24), find (21), tell (21), believe (19), write (17), describe (15), suggest (14)

Figure 1. Representation of 6 prominent topics from the literature and key related events. The corpus should reflect these topics if the *Times* attempts comprehensive coverage of clinical depression and anxiety.

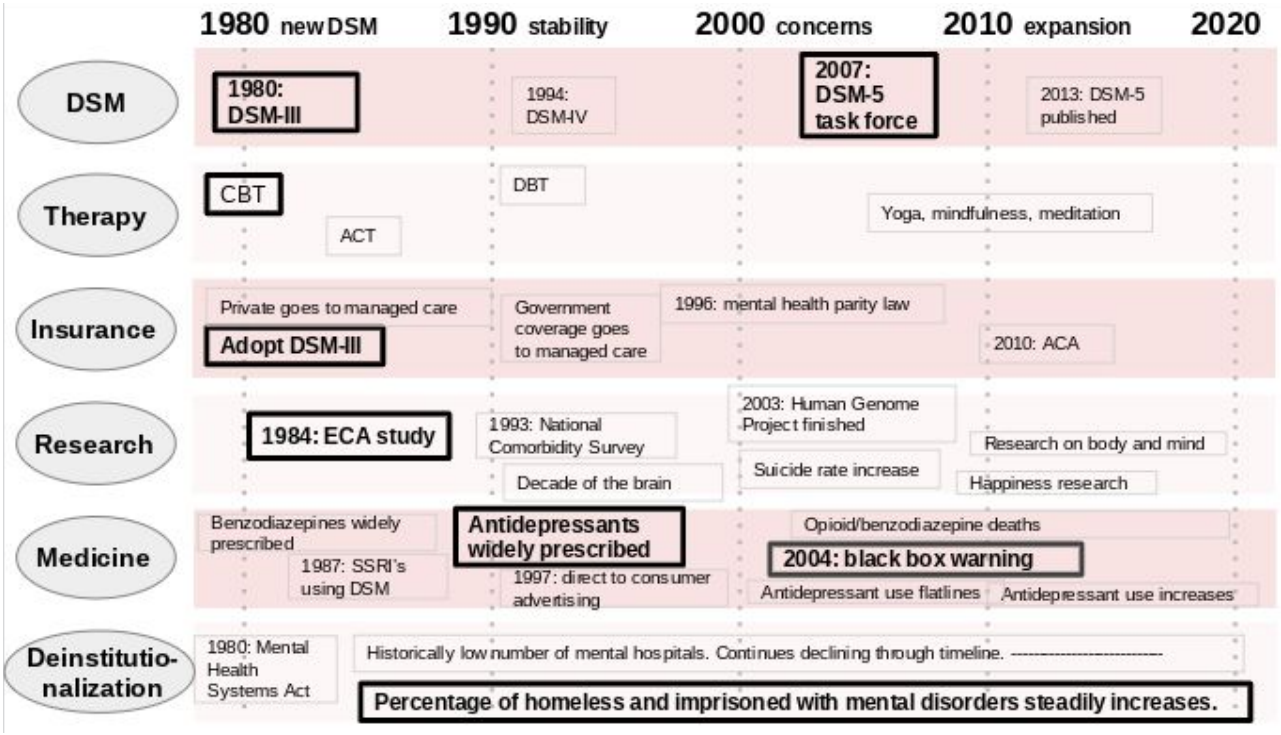

Figure 2. Total number of articles in the corpus graphed over time. There is both a raw count, and a count standardized by the median number of articles for all *Times* articles over the years covered in the corpus, 93,5000. N = 5,616.

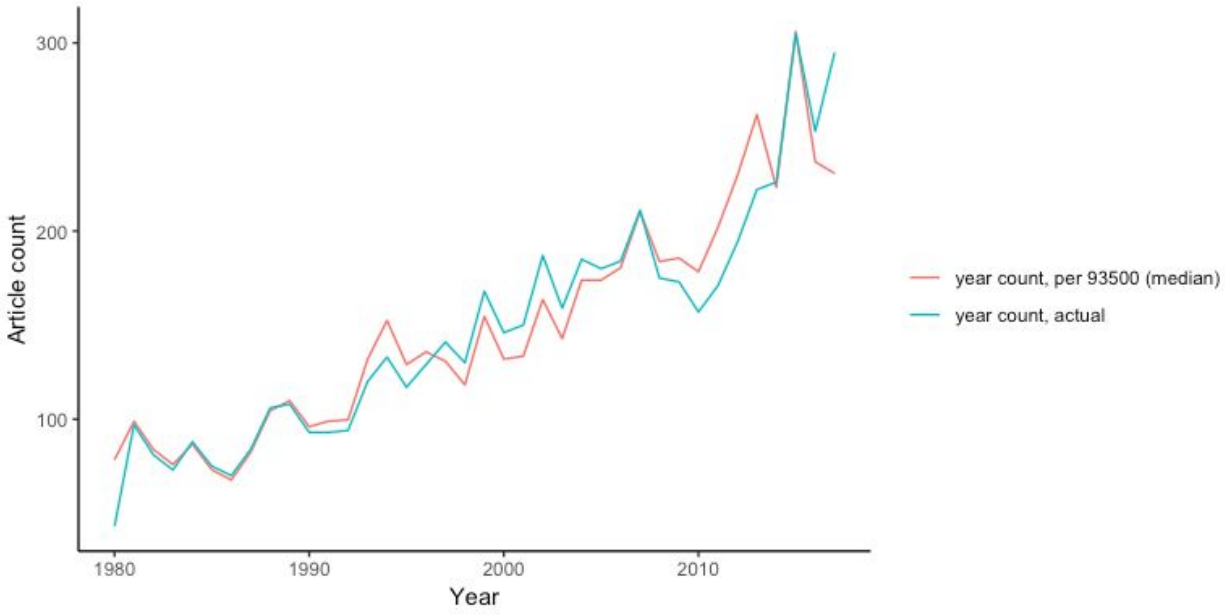

Figure 3, Google Books Ngram Viewer, as it appears on Google. It graphs, of all books in the Google corpus of American English books, what percentage of bigrams (or unigrams in the case of single-term searches) are made up of mental health or mental illness, major depression, generalized anxiety, or mental disorder. For the case of mental health and mental illness, multiplying by .1 makes the trends for the other terms easier to visualize.

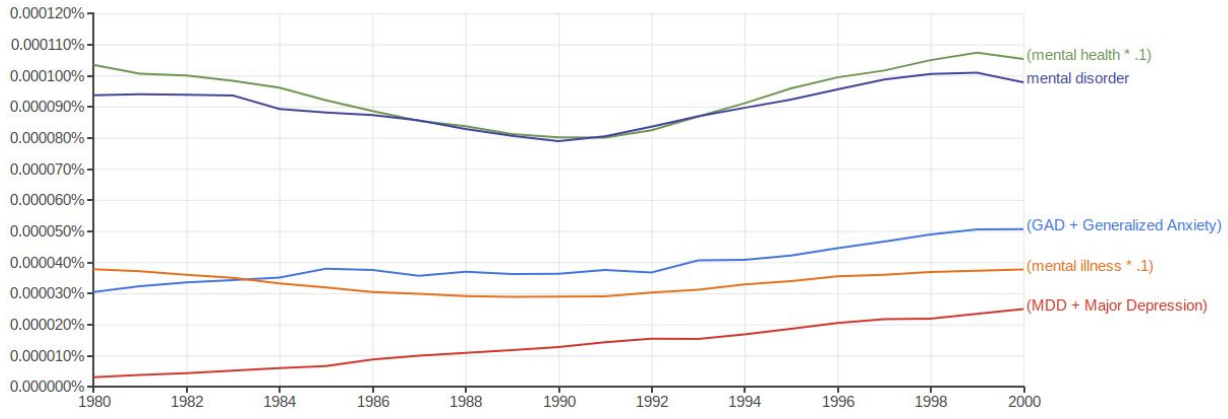

Figure 4. Count per year of articles that use the DSM wording to specify MDD and GAD, compared to the articles that mention anxiety or depression and do not specify it as MDD or GAD. N = 5,616.

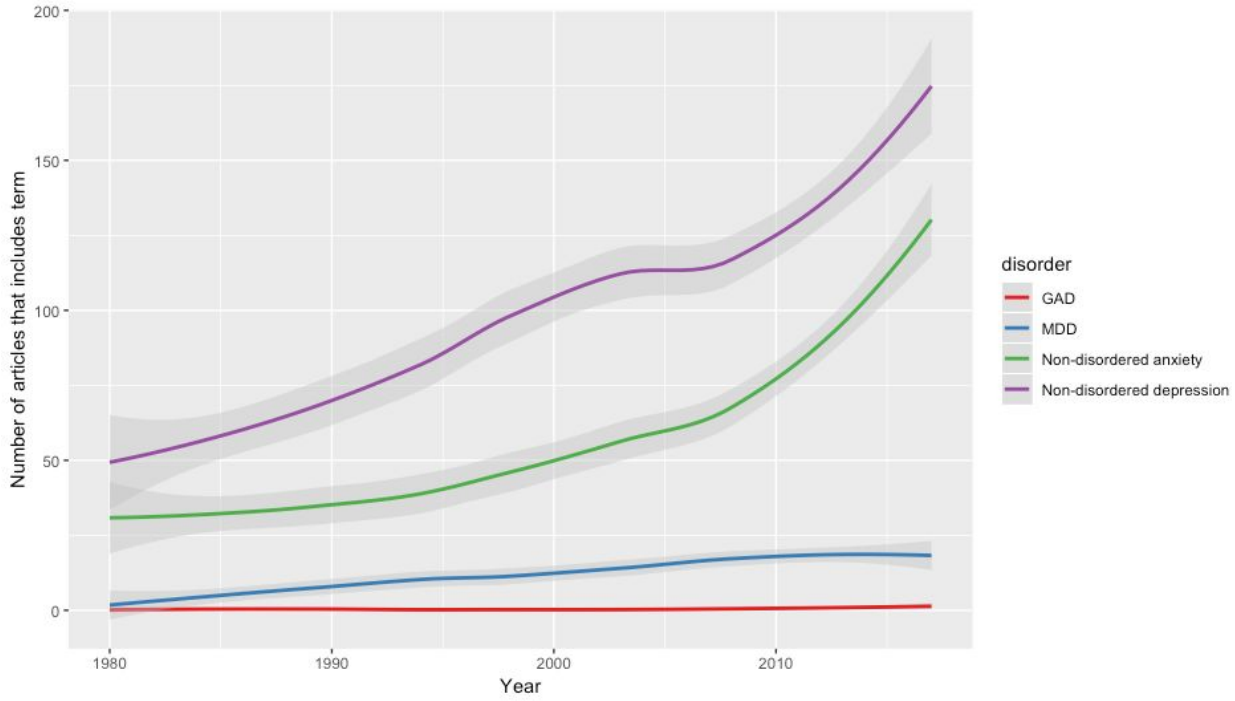

Figure 5. Each topic from Figure 1 is replaced by a corresponding topic from the topic model. For each topic, the solid line represents the number of articles with 20% or more words assigned to that topic each year, and the dotted line those articles wherein 5% to 10% of the words are assigned to the topic. N = 5,616.

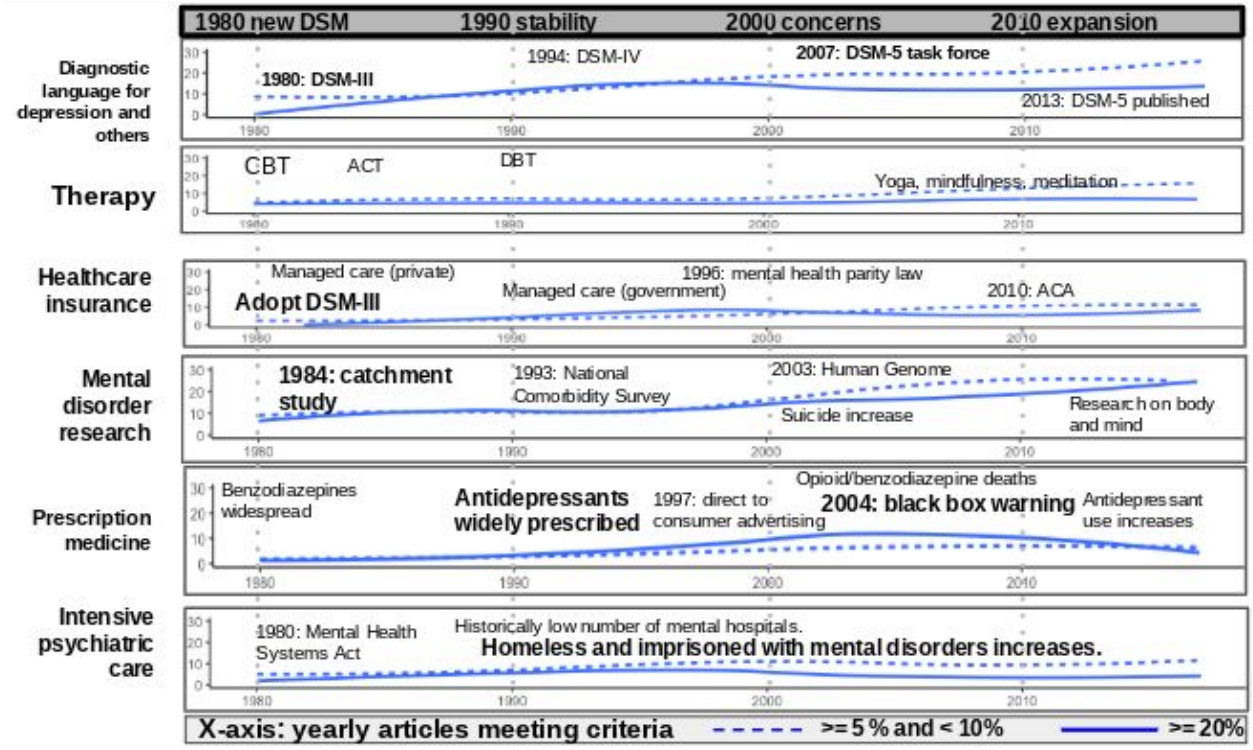

Figure 6. A screenshot of the bottom of the home page for the *Times* website taken March 25, 2019. Demonstrates how they organize their sections.

Figure 7. The number of articles in each given section per year, without main News section. N = 2400.

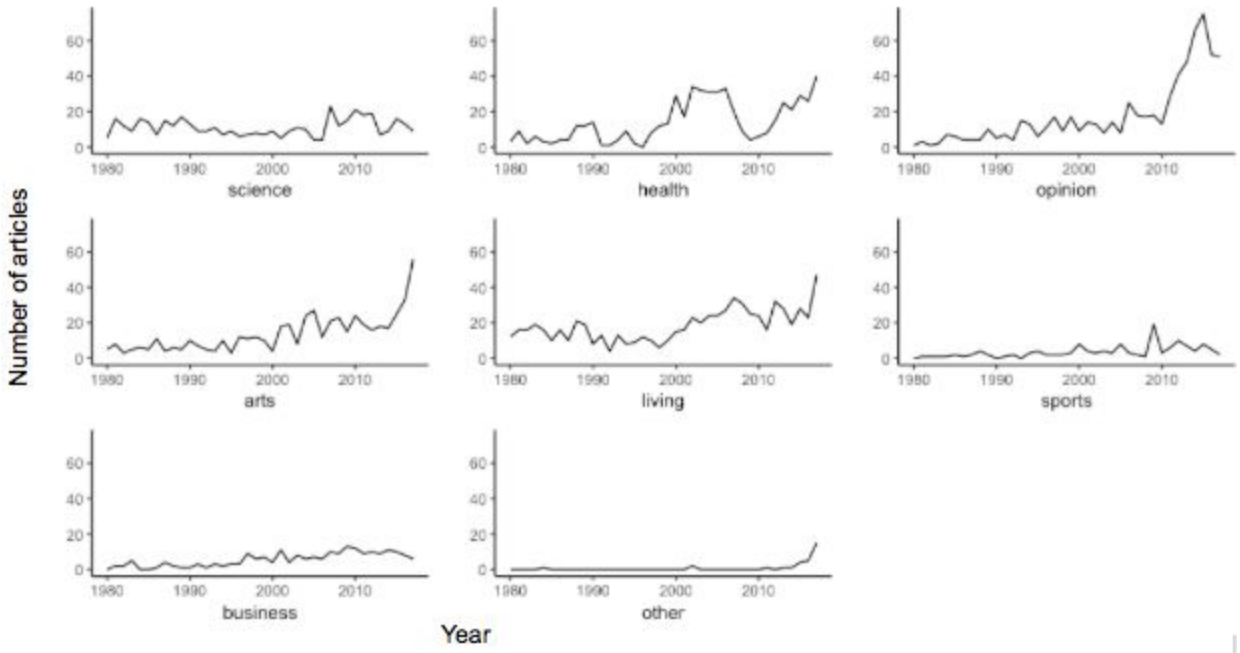

Figure 8. The number of articles in the main News section, over half of the corpus. N = 3,216.

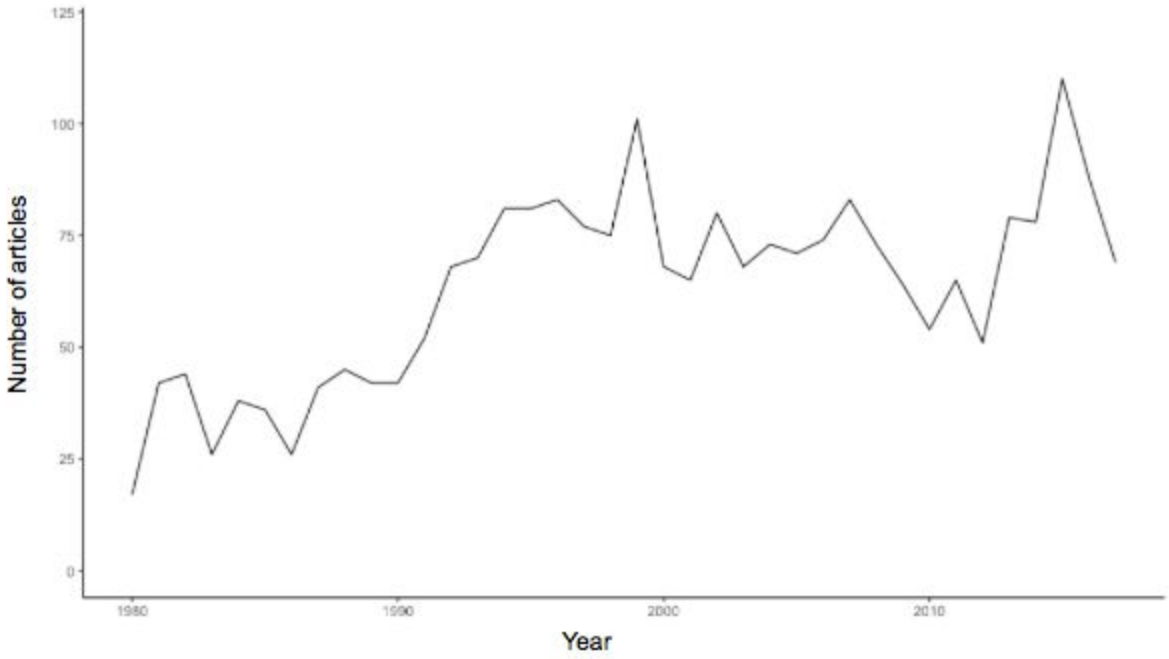

Figure 9. Loess line for the number of articles each year that mention the American Psychiatric Association. N = 266.

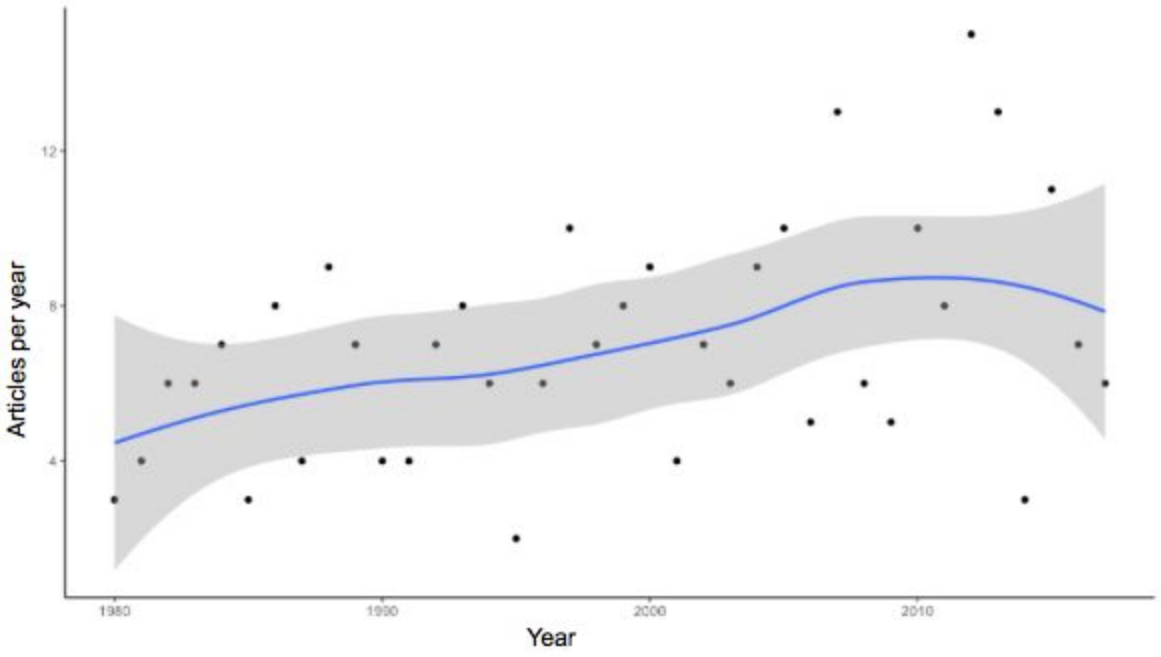

Figure 10. The number of times each psychiatry lemma functions as a nominal subject in a given year. N = 1350.

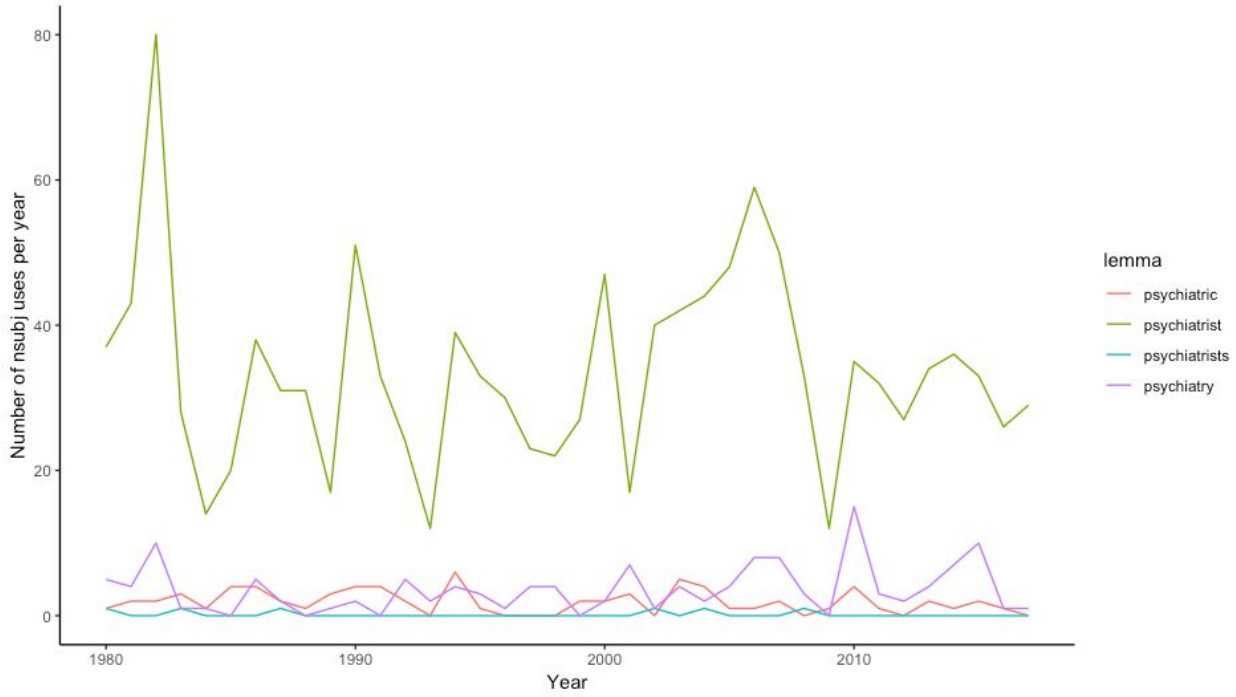

Figure 11. Bar graph for the number of articles each year that mention the DSM and have a true value for each given variable logic. N = 156.