

# *Public Opinion on Health Care Reform: Difference between YouTube and Professional News*

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**Abstract:** During 2009-2010, the Obama administration focused on three main dimensions for popularizing the Obama Healthcare Reform Plan (OHRP): (d1) stability and security, (d2) quality and affordability, and (d3) funding\*. The Internet is the most widely used information source in the world. One of the most popular Internet sites, in addition to online news sites is YouTube. In this study, we identify the opinions of professional writers (as expressed in online news sites) and YouTube users (as expressed in comments on YouTube videos) about OHRP, in general, and these dimensions in particular. Web Content analysis [1] was used to identify the frequency with which Web users related to these three dimensions of the OHRP and sentiments expressed about them. Professional writers were found to treat the three dimensions far more frequently (i.e., 53% of the cases) than YouTube users (21% of the cases). Thus, professional writers are more focused in approaching the issue than YouTube users. Both professional writers and YouTube users focused more on the quality and affordability dimension, with 38.11% of the dimension-focused cases for professionals and in the case of 46.60% of the dimension-focused for YouTube users. In addition, the quality and affordability dimension received much positive sentiment by both professional writers (%=45.03) and YouTube users (%=44.23). Finally, the funding dimension received much negative evaluation by professional writers (%44.28) and YouTube users (%=43.57). This study reveals that the sentiments expressed in the opinion of YouTube users are not strikingly different from the opinions of professional writers.

\*[www.whitehouse.gov/assets/documents/obama\\_plan\\_card.PDF](http://www.whitehouse.gov/assets/documents/obama_plan_card.PDF).

## I. INTRODUCTION

Opinions expressed in professional news media have traditionally been considered valuable for policy makers [2]. In addition to professional media, user opinion as expressed in social network sites can affect, for example, healthcare reform [3].

The Internet is the most widely used source for obtaining information in the world. One the most popular Internet sites is YouTube. YouTube is one of the fastest growing websites on the Internet and the fourth most-accessed site in the United States [4]. As of October 2007, YouTube was reported to be serving over 100 million views and 65,000 new video uploads per day [5]. Visitors can enter a word or phrase into the provided search engine to locate posted videos on a specified topic. Visitors can also browse videos and read comments on videos posted by other users. There is also the option for anyone (of any age) to register for a free YouTube account, which provides access to uploading videos and posting comments. The site also provides video sorting options such as by relevance or number of views. Capra et al. [5] suggest “[YouTube] provides popular venues for individuals and organizations to express their views, opinions, and shared lives with the larger community of web users, which in turn may affect thought and behavior in realms such as politics.”

One of the more recent areas of focus in politics, specifically public opinion, is President Obama’s health care reform. Americans consistently rank health-care reform among the four greatest problems facing the country. However, opinion in how reform should be undertaken is almost split perfectly evenly between the populations. A study by Blendon & Benson [3] synthesized the results of several Gallup polls regarding healthcare reform, and came up with several conclusions on how public opinion may affect health care reform (i) Americans want health care reform but opinion is exactly split on how to enact that reform. (ii) Issues regarding if people want government involvement are almost at an even 50-50. (iii) Most people want change but the inability to agree on a strategy will ultimately inhibit any type of reform proposed; therefore nothing will actually

get done until people get to be on the same page with health care reform.

#### A. Goal and Research Questions:

The Pr. Obama administration focused on three main dimensions for popularizing the OHRP: (1) stability & security, (2) quality & affordability, and (3) funding: see [www.whitehouse.gov/assets/documents/obama\\_plan\\_card.PDF](http://www.whitehouse.gov/assets/documents/obama_plan_card.PDF). In the current paper, our goal is to identify how the OHRP in general and these dimensions in particular was received by professional (as expressed in online news sites) and lay Web users (i.e. YouTube users as expressed in comments on YouTube videos). More specifically, the following are our research questions:

**Q1:** To what extent did Web users relate to the three dimensions of the OHRP in their participations?

**Q2:** What were the sentiments of Web users toward each of the three dimensions publicized by the OHRP?

#### B. Data Collection and Sampling:

*The professional corpus:* The professional corpus is collection of news articles manually collected from 105 popular online news sites (e.g., ABC News, The Associated Press, Belfast Telegraph, Bloomberg Business Week, CBC, CBS, Chicago Tribune, CNBC, CNN, Daily Finance, FOX News, The Guardian). Articles were selected by searching the websites of the sites using all combinations of the queries “Obama healthcare”, “Obama health reform”, and “health care reform”. Only articles written by professionals treating the specific subject of OHRP that were published between October 2008 and September 2010 were included. The unit of analysis for articles was the paragraph, and hence articles were manually divided into their component paragraphs (making up 1865 paragraphs).

*The YouTube corpus:* Google’s YouTube Data API was used to crawl all comments on the first retrieved 1000 YouTube videos using the query “Obama health care”. A total of 2200 comments were randomly sampled from the pool of 200,000 retrieved comments. After filtering non-English comments, a total of 2172 comments were kept for analysis.

## II. METHOD

Web Content analysis [1] was used to identify the frequency with which Web users related to the three dimensions of the OHRP mentioned above and sentiments expressed against them. The three codes for dimensions were (1) stability & security, (2) quality & affordability, and (3) funding. We followed Wiebe, Bruce, and O’Hara [6] in operationalizing sentiment annotation. In other words, if it was felt that the primary goal of a comment/paragraph is the objective reporting of information; it was labeled as objective (i.e., lacking opinion). Otherwise, a comment was judged as a candidate for one of four subjective (i.e., opinion-bearing) classes (i.e., (1) subjective-positive, (2) subjective-negative, (3) subjective-neutral, and (4) subjective-mixed). Two native speakers of English coded the two corpora, with inter-rater

agreement reaching 93.5% in for dimensions and 89% for subjectivity.

#### A. Selection of Online News Articles

We selected one hundred and five online news articles regarding health reform from the following sources: ABC News, The Associated Press, Belfast Telegraph, Blogger, Bloomberg Business Week, CBC, CBS, Chicago Tribune, CNBC, CNN, Daily Finance, FOX News, The Guardian, Globe, Huffington Post, Human Events, Las Vegas Review Journal, LifeNews, Lost Angeles Times, Mediaite.com, Medical News Today, MSNBC, New York Times, Newsweek, Politico, Salon.com, Suite 101, The Associated Press, The Australian, The Baltimore Sun, The Fiscal Times, The Irish Times, The New Republic, U.S. News, Virginian-Pilot, Washington Post, WebMD News, and Zap2it.

Articles were selected from the websites of the sources using the search terms “Obamacare”, “Obama health reform”, and “health care reform” on the search engine of the websites. Articles were ordered “by date” in order to identify articles written before and after the ACA was passed. Articles were included if they were written by professionals in the field of media who refer to politicians and health care professionals to support their arguments. Fifty-one articles were written before the Affordable Care Act was passed, and fifty-four articles were written after the Affordable Care Act was passed. The articles were published between October 2008, and September 2010.

We conducted the content analysis on the paragraphs of the articles. Paragraphs were selected out of articles by utilizing Microsoft Word’s *Insert* → *Table* → *Convert Text to Table* function with the separation criteria set at “Paragraphs”. A total of 1865 paragraphs were annotated and included in the analysis, 1018 paragraphs before ACA was passed and 847 after ACA was passed.

#### B. Selection of YouTube Comments

We used Google’s YouTube Data API to crawl all comments on 1000 YouTube videos using the query “obama health care”. The pool of comments (henceforth the YouTube health care corpus [YiHCCa]) is composed of 2200 comments. After filtering non-English comments, YiHCCa totaled 2172 comments. Two native speakers of English annotated YiHCCa for subjectivity at the comment level. Each annotator was required to decide whether a comment is textitsubjective or textitobjective. We followed Wiebe, Bruce, and O’Hara [6] in operationalizing each of the two categories. In other words, if it was felt that the primary goal of a comment is the objective reporting of information, it was labeled as objective. Otherwise, a comment was annotated as subjective.

A “python program details” was utilized to crawl YouTube and extract the comments from all of the videos on YouTube. From The 1000 YouTube videos, 2171 comments were randomly selected to be annotated. 459 of

these comments were selected to be part of the content analysis because they specifically addressed health care reform.

*C. Classification of Subjectivity and Objectivity*

A paragraph or YouTube comment was categorized as “Subjective” if the author was including personal feels, opinions, or speculations on a topic. For example, a paragraph that included language such as “I think this plan is a good idea” or “I believe that health care reform will not benefit Americans” would be classified as subjective.

A paragraph or YouTube comment was classified as objective if the author was stating a fact, and not including a subjective judgement. A paragraph that included statements such as “40 million Americans do not have health insurance” without any commentary from the author was classified as an objective paragraph. Examples of these paragraphs from the dataset can be found in Tables 2A, 2B; 3A and 3B.

*D. Classification of Tone*

The tone of each paragraph and YouTube comment was assessed as positive, negative, neutral, or mixed. A paragraph was classified as “positive” if the author included a favourable judgement of the topic, “negative” if the author did not agree with the topic, “neutral” if the authors included their thoughts but did not take a specific stance on a topic, and “mixed” if the author included both positive and negative judgements regarding a particular topic. Tables 1A, 1B; 2A and 2B provide examples of the different tones within the dataset.

Table 1A- Examples of Objective News Article Paragraphs by Dimension

<b>Stability and Security</b>	President Obama took his health care reform plan to the American people in a forum at the White House Wednesday night broadcast live on ABC. Obama took questions on a wide variety of topics, from how he plans to pay for the reform to whether people will be able to keep their current insurance plans and doctors.
<b>Quality and Affordability</b>	Massachusetts became the only state to mandate health insurance in 2006. It has passed legal muster and led to 97 percent of residents having some form of coverage, said Alan Sager, director of the Health Reform Program at Boston University's School of Public Health.
<b>Funding</b>	The House plan is projected to guarantee coverage for 96 percent of Americans at a cost of more than \$1 trillion over the next 10 years, according to the nonpartisan Congressional Budget Office.

Table 1B- Examples of Subjective News Article Paragraphs by Dimension and Tone

<b>Stability and Security</b>	
<b>Positive:</b>	No longer do insurance companies in the United States get to pick and choose who gets coverage," Sebelius told a crowd of Democratic supporters in Henderson. "Insurance companies have to actually cover people when they get sick.
<b>Negative:</b>	Frustrated patients, crowded emergency rooms and burdensome insurance requirements are driving good physicians into other professions and making patients feel hopeless. Our system was not working, and we cannot afford to quietly stand by while one in seven lack access to basic care and one in six people live in poverty.
<b>Neutral:</b>	However, ahead of this provision, several large health insurance companies announced plans to suspend child-only insurance policies because of concerns over clarity of the new rules, as well as reservations that the provisions create an "unlevel playing field.
<b>Mixed:</b>	The paradox was that each day of extended life for Gwendolyn brought the Strongs closer to the precipice. "I want my daughter to survive," Mr. Strong said. "But nobody wants to have the threat of complete bankruptcy looming over their head. It's just kind of inhumane the way the world works in these brutal situations.
<b>Quality and Affordability</b>	
<b>Positive:</b>	About 11.3 million of the 46 million Medicare beneficiaries are in private Medicare Advantage plans, which offer comprehensive care in return for monthly premiums. While premiums for a particular plan in a particular county may increase next year, beneficiaries may be able to find other plans offering a better deal.
<b>Negative:</b>	Moreover, she said, if Congress repeals the law, small businesses will lose tax credits that help pay for health benefits, and officials will lose tools needed to root out fraud in Medicare and Medicaid.
<b>Neutral:</b>	If insurers withdraw from a market, consumers may have fewer health plan choices, and the remaining carriers may have less competition.
<b>Mixed:</b>	This 1099 reporting was a well-intentioned provision to try to catch people who were cheating on their taxes," Mr. Murphy said. "But it has some unintended consequences and could be a huge hassle for a lot of small businesses.
<b>Funding</b>	
<b>Positive:</b>	Faced with a divided public over his signature legislative achievement, President Barack Obama on Wednesday hailed the health care reform bill passed in March as important for helping both the government and the American people deal with rising medical costs.
<b>Negative:</b>	"The measure endured a bitter political fight that saw no Republicans vote for its final approval, and recent polls show it remains controversial as Democrats face congressional elections in November amid a tough climate due to lingering economic woes.
<b>Neutral:</b>	Here's one that's already in effect: If you are a senior citizen, you will get a one-time rebate of \$250, tax free, if you have Medicare prescription drug coverage and fall in the "doughnut hole." As of August 2010, 1 million rebate checks were sent, according to the White House's website.
<b>Mixed:</b>	Until we have single payer/universal health care, we won't have any reform of any meaning. Nixon's HMOs now run the show and no one in Congress has the courage to slay the beast.

Table 2A- Examples of Objective YouTube Comments by Dimension

<b>Stability and Security</b>	I was denied coverage as spinal fractures were misdiagnosed (by the insurer's doctor, who avoided the cost of a CT scan) concluding my 25% spinal misalignment was pre-existing.
<b>Quality and Affordability</b>	The goal of mandatory healthcare was there from the start. The bill was written by the insurance companies
<b>Funding</b>	The cost will be under a trillion, check your facts.

E. Classification of Dimensions of Health Care Reform

The criteria for the three dimensions of health care reform were taken from the White House Government Website and a YouTube video of ([www.youtube.com/watch?v=bauPmy3gS](http://www.youtube.com/watch?v=bauPmy3gS)) President Obama explaining the details of the health care reform plan. The three dimensions are stability and security, quality and affordability, and funding. A paragraph was classified as "other" if it did not address any of the dimensions. A full explanation of the classification criteria for the three dimensions can be found in Table 3. Examples of paragraph and YouTube comments from the dataset that mention the three dimensions can be found in Tables 1A, 1B; 2A and 2B.

F. Inter-rater Reliability

The paragraphs were annotated by two coders who were trained in the classification criteria by the research team. Annotating was done independently by the two coders, and disagreements in coding were mediated by a research official. Kappa test was performed to calculate inter-rater reliability, which was 90% for subjectivity/objectivity coding, and 90% for dimension coding.

III. RESULTS

We conducted a Chi-Square, t-test, and an exact binomial procedure statistics to compare independent sample proportions to analyze the differences in dimension and tone distribution between news articles and YouTube comments. Most of comparisons have significant differences with  $p < 0.05$ . Overall, a greater percentage of news articles address a topic other than the three dimensions than YouTube comments (45.95% and 34.42%, respectively) (Figure 1). A higher proportion of YouTube comments address the quality/affordability dimension than news articles (35.75% and 20.38% respectively).

Both news articles and YouTube comments had significantly higher proportions of subjective statements than objective statements (15.7% objective, 84.3% subjective for news articles; 4.1%, objective and 95.9% subjective for YouTube comments) (Figure 2). YouTube comments had a significantly lower proportion of objective comments than news articles. (4.1% and 84.3%, respectively)

Table 2B- Examples of Subjective YouTube Comments by Dimension and Tone

<b>Stability and Security</b>	
<b>Positive:</b>	Thanks. I appreciate it. I just cannot believe that people are falling prey to these insurance companies that only care about making money, and not providing people the services they need. People will fall ill whether they like it or not. Human body is not immune to all the diseases and viruses that are out there. People SHOULD get COVERAGE for all kinds of illnesses. HEALTH COVERAGE IS A HUMAN RIGHT, NOT A PRIVILEGE.
<b>Negative:</b>	It's people like you who are harming the American health care system by wanting to keep the status quo which is bankrupting Americans already and will bankrupt more of them as insurance premium costs continue to rise at three times the cost of living as they have all along.
<b>Neutral:</b>	66% of bankruptcies are because of unpaid medical bills, don't lose your job; OK!
<b>Mixed:</b>	You are crazy...! 86% of our citizens DO HAVE HEALTH INSURANCE and 100% have health CARE because it's against the law to deny it. Please stop spewing lies.
<b>Quality and Affordability</b>	
<b>Positive:</b>	And are you forgetting about the highly efficient MEDICARE system? Doctors, patients, and nurses are all, overall, extremely happy with it.
<b>Negative:</b>	Obama doesnt want to provide healthcare for the masses as much as he wants to get his hands on the benefits your employer pays on your behalf. The new slogan will be: Im over 60. Why do democrats think I dont deserve medical care? Republicans need to stop being intimidated and stand up for America or resign, go home and have Special Elections to fill their seats. Why wait for 2010?
<b>Neutral:</b>	Ask the swiss what they think of theirs, they have social healthcare, and are officially rated "highest standard of living" in the world. What you odn't understand is that the 1 cost that is high you are referring to, is more than offset by the reduction in ALL other aspects.. Example, 2 years ago I paid \$105 U.S. for an antibiotic, then the US government took over production of it... this year, I paid 1 dollar for the same 20 count bottle.
<b>Mixed:</b>	That would be bad...especially for people who have employer driven insurance in the US, the best in the world....too good in fact, and that's the reason we have to stop tacking employment to health insurance! Even France is a two tier insurance system, not "socialist health care"
<b>Funding</b>	
<b>Positive:</b>	That kind of statistic will prove anything you want until you actually put it in context. Universal single payer heathcare will happen, the only question is when. We have a chance to be part of the solution NOW, let's take it!
<b>Negative:</b>	I'm not saying that, I'm saying that I have no obligation to provide for your healthcare, just like other Americans aren't.
<b>Neutral:</b>	You can only think single payer is government control if you watch Rush Limbo and don't understand the subject.
<b>Mixed:</b>	You are right on few things. but u are wrong in one thing. that is Administrative cost in medicare is way less then private. Its what u call overhead. that means out of all the profit they get only 4% goes to administrative costs. but in private company about 30 to 40% goes to administrative cost. for example administrative person in medicare will make 150k a year but someone in private company will make 2 to 4 million a year. U UNDERSTAND WHAT I AM SAYING?

Table 3: Annotation Guide for the Three Dimensions and Dimension Themes

<b>Stability and Security</b>
<ul style="list-style-type: none"> <li>• “Ends discrimination against people with pre-existing conditions”.</li> <li>• Prevents insurance companies from dropping coverage when people are sick and need it most.</li> <li>• Caps out-of-pocket expenses so people do not go broke when they get sick.</li> <li>• Eliminates extra charges for preventive care like mammograms, flu shots, and diabetes tests to improve health and save money.</li> <li>• Protects Medicare for seniors and eliminates the “donut-hole” gap in coverage for prescription drugs.</li> </ul>
<b>Key Phrases:</b> Pre-existing conditions, dropping coverage, out-of-pocket expenses, extra charges for preventative care, donut-hole, seniors, protecting Medicare
<b>Quality and Affordability</b>
<ul style="list-style-type: none"> <li>• Creates a new insurance marketplace – the Exchange – that allows people without insurance and small businesses to compare plans and buy insurance at competitive prices.</li> <li>• Provides new tax credits to help people buy insurance and to help small businesses cover their employees.</li> <li>• Offers a public health insurance option to provide the uninsured who cannot afford coverage with a real choice.</li> <li>• Offers new, low-cost coverage through a national “high risk” pool to protect people with pre-existing conditions from financial ruin until the new Exchange is created.</li> </ul>
<b>Key Phrases:</b> Insurance marketplace, exchange, public option, provide uninsured with a real choice, high-risk pool, protect those with pre-existing conditions from financial ruin, low-cost coverage, coverage for all Americans, tax credits for businesses
<b>Funding</b>
<ul style="list-style-type: none"> <li>• Will not add a dime to the deficit and is paid for upfront.</li> <li>• Creates an independent commission of doctors and medical experts to identify waste, fraud, and abuse in the health care system.</li> <li>• Orders immediate medical malpractice reform projects that could help doctors focus on putting their patients first, not on practicing defensive medicine.</li> <li>• Requires large employers to cover their employees and individuals who can afford it to buy insurance so everyone shares in the responsibility of reform.</li> </ul>
<b>Key Phrases:</b> Deficit, debt, spending, paid for upfront, waste, fraud, medical malpractice reform, large employers to cover employees, defensive medicine
Source: United States White House Office ( <a href="http://www.whitehouse.gov">www.whitehouse.gov</a> )

YouTube comments had a higher proportion of negative statements and lower proportion of positive statements than news articles (45% and 17.41% negative,

8.41% and 16.5% positive, respectively) (Figure 3). News articles had a higher proportion of neutral and mixed statements than YouTube comments (66.10% and 46.59%, respectively). Within the YouTube comments, there is a higher proportion of negative than positive statements (8.41% positive and 45% negative), while there are no differences in negative and positive statements in the news articles (16.50% positive and 17.41% negative). News articles had a higher proportion of neutral/mixed statements than negative or positive statements (66.10% neutral/mixed, 16.5% positive, 17.41% negative), while YouTube had equal proportions of neutral/mixed and negative statements (46.59% neutral/mixed, 45% negative), and a higher proportion of neutral/mixed statements than positive statements (46.59% neutral/mixed and 8.41% positive).

In terms of the distribution of tone by dimension between the sources, news articles had a greater proportion of positive statements regarding stability/security, quality/affordability, and other than YouTube comments (Figure 4). YouTube Comments had a greater proportion of negative statements on stability/security, quality/affordability, and other than news articles. For the funding dimension, YouTube comments and news articles did not have any significant differences ( $p > 0.05$ ) in the proportion of positive and negative statements. The percentages can be found in table 4.

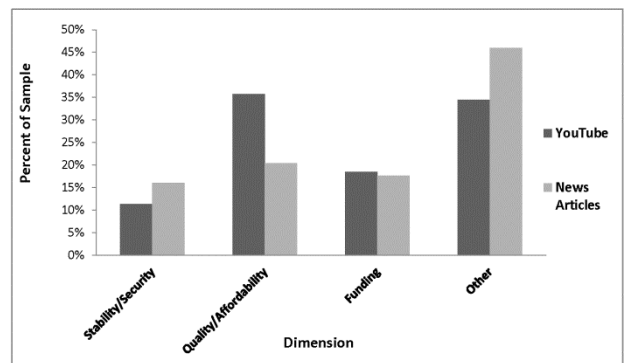


Figure 1: Dimension Composition between News Articles and YouTube Comments

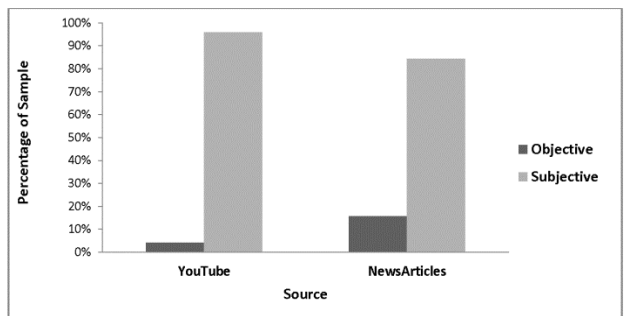


Figure 2: Percentage of Objective and Subjective Statements

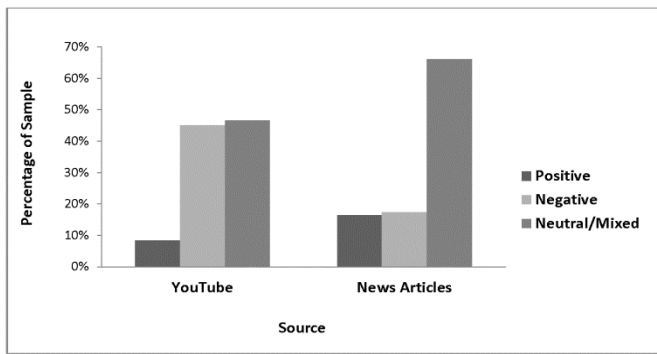


Figure 3: Distribution of Subjective Tone between Sources

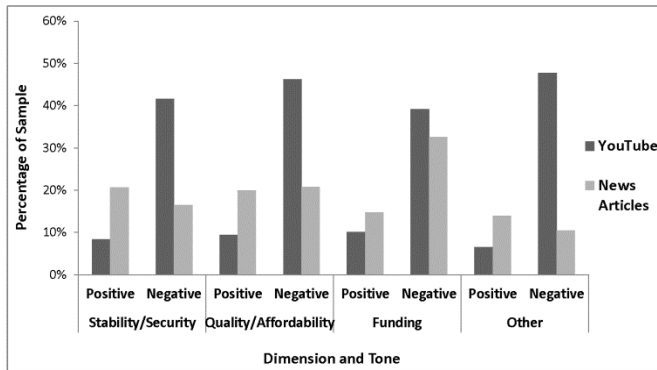


Figure 4: Tone of Sources by Dimension

Table 4: Percentages of Tone by Dimension

Stability and Security		
Source	Positive	Negative
YouTube	8.33%	41.67%
News Articles	20.62%	16.49%
Quality and Affordability		
Source	Positive	Negative
YouTube	9.38%	46.25%
News Articles	19.92%	20.73%
Funding		
Source	Positive	Negative
YouTube	10.13%	39.24%
News Articles	14.81%	32.59%
Other		
Source	Positive	Negative
YouTube	6.54%	47.71%
News Articles	13.97%	10.47%

#### IV. DISCUSSION

Professional writers were found to treat the three dimensions far more frequently (i.e., 53% of the cases) than YouTube users (21% of the cases). This shows that professional writers are more focused in approaching the issue than YouTube users. Both professional writers and YouTube users focused more on the quality and affordability dimension, with 38.11% of the dimension-focused cases for professionals

and in the case of 46.60% of the dimension-focused for YouTube users. In addition, the quality and affordability dimension received most of the positive sentiment by both professional writers (%=45.03) and YouTube users (%=44.23). Finally, the funding dimension received most of the negative evaluation by professional writers (%44.28) and YouTube users (%=43.57).

These results show that while YouTube users digress more from directly evaluating the various dimensions of the OHRP, their evaluations are close to those of professional writers.

Research shows public opinion regarding health care reform is evenly split. This is supported by our data revealing the subjective comments in the professional news articles to be highly neutral/mixed. Among the subjective commentary in the news articles, the comments coded as positive or negative are relatively even. These findings show that public opinion is accurately portrayed through online professional news articles.

Between the YouTube and online professional news articles, both show significantly more subjectivity than objectivity regarding the health care reform. This could indicate some similarities between the two venues in that both are higher in subjectivity. However, our data shows significantly more negativity in the subjective YouTube comments. This is very different from public opinion as seen in the news articles. In each of the four dimensions of health care reform (stability/security, quality/affordability, funding, and other) more of the comments written on YouTube were negative.

The key issue is that the comments on YouTube share a drastically different tone than that of professional news articles. Being that YouTube is becoming a source of information, the content should match that of public opinion and furthermore news articles.

The negativity portrayed in the YouTube comments could be attributed the anonymous nature of YouTube. Users are identifiable by arbitrary user names which may not be linked to their real identity in anyway (name, address, etc.). Therefore, because individuals may feel protected by anonymity, they may be more inclined to share their negative opinions on health care reform.

Further work is needed to assess the individuals who read the YouTube comments to see if their opinion on health care reform changed after reading. It may be that people are reading the comments and because media has an effect on behavior, it turns others to being negative. Or, perhaps people are just more negative when it comes to anonymous blogging.

#### V. COCLUSION

This study shows that the sentiment expressed in the opinion of YouTube users are not strikingly different from the opinions of professional writers. In addition, the results show that YouTube users are not as focused as professional writers, which reflects the interest of these YouTube users in involving in conversation with one another not necessarily about the content of the video.

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