LOUD AND UNCLEAR-AN EXPLORATORY EMPIRICAL VOCAL ANALYSIS OF RISKS VERSUS REWARDS IN DIRECT- TO-CONSUMER TELEVISION ADVERTISEMENTS

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ABSTRACT

Little research has been performed on the vocal presentation of risks and benefits in DTC prescription drug advertisements. We analyzed the effects of the vocal presentations of negative side effects and benefits in prescription drug Direct-to-Consumer advertising. We also analyzed the rate of speech, pitch range of speech, duration spent, and quotients of risk information compared to benefit information, listed in DTC ads. The data was examined to see if the severity of the ailment and/or the date the ad was released impacts the vocal presentation of side effects. Contrary to expectations, more time was allocated to stating the risks in comparison to the benefits. However, the rate of speech was faster during the delivery of risks involved. These results suggest the need for standardization in rate of speech for advertisements such that both benefits and risks of medication are perceived equally by the audience.

Keywords: Direct to Consumer Advertisements, Vocal Analysis, Risks, Rewards, Television Advertising.

INTRODUCTION

Direct to consumer advertisements of prescription medications are focused on appealing to the needs of customers. Unlike the days when drugs were only marketed to physicians, now direct to consumer advertisements provides average people with the awareness of the various medications available on the market. Armed with the knowledge of treatment options, patients now can influence what medications their physicians prescribe to them. There is a great deal of controversy that surrounds how much influence direct to consumer advertising has over pushing certain treatments. Currently, the United States and New Zealand are the only two developed countries that allow pharmaceutical companies to advertise directly to consumers (Bell et al., 2000). The U.S. government has set detailed regulation about how information about prescription medications are presented to the public (Mogull, 2008).

The purpose of this research is to analyze the vocal communication of risks versus benefits in Direct-to-Consumer advertisements of prescription drugs. We compare the differences between the vocal presentations of the drug risks compared to the presentation of drug benefits in DTC commercials. DTC commercials, ranging from the year 2000 to 2014. The paper is organized as follows. We discuss the debate, the background, and the regulations for direct to consumer advertising. We then present a summary of the existing literature over direct to consumer advertising. We then discuss the methodology and the results. We conclude with a

discussion of results and implication.

Direct-to-consumer advertising (DTCA) is a controversial subject (Auton, 2004; Chandra & Miller, 2005; Folsom et al., 2010; Frosch et al., 2010; Mukherjee et al., 2013). Those who support DTCA believe that by directing pharmaceutical advertisements specifically at consumers it allows the public to become more informed of potential health concerns and medical treatments. Alternatively, those who oppose DTCA think that by advertising prescription drugs directly to consumers, pharmaceutical companies are harming the physician and patient relationship and manipulating healthy individuals to make requests for unnecessary drugs.

Debate

Currently, the United States and New Zealand are the only two developed countries that allow pharmaceutical companies to advertise directly to consumers (Block, 2007). Direct-to-consumer advertising (DTCA) is a controversial subject. Those who support DTCA believe that by directing pharmaceutical advertisements directly at consumers it allows the public to become more informed of potential health concerns and medical treatments. Alternatively, those who oppose DTCA think that by advertising prescription drugs directly to consumers, pharmaceutical companies are harming the physician/patient relationship and manipulating healthy individuals to request unnecessary drugs. This summary will provide a brief regulatory background and an outline of the major arguments for and against DTCA.

Pros

DTCA allows consumers to have more control over their health. The Internet, TV and print advertisements for prescription drugs provide consumers, who otherwise might not have access to medical information, with the knowledge of the latest health treatment options (Auton, 2006). DTCA encourages consumers to meet with their physicians. A 2004 study by the FDA showed that DTCA prompted 27% of the U.S. population to meet with a physician to seek more information about an existing ailment (Ventola, 2011). The prescription medication ads increase communication between patients and their physicians. Informed viewers of DTCA are given the confidence to ask more instructive questions regarding their health issues. DTCA is known to lead to better patient compliance. According to a study conducted by the FDA in 2003, 54% of doctors believed that "*DTCA improved patient compliance by increasing the probability of the patient taking their medicine properly*". The pharmaceutical advertisements create awareness of rare or uncommon health conditions. For instance, before Procrit, a medication that treats anemia, was advertised, medication to prevent fatigue was rarely prescribed by doctors because people did not discuss their symptoms of fatigue with their physicians. After the Procrit campaign aired anemic chemotherapy cancer patients realized they could combat their symptoms of fatigue by requesting to take the medication Procrit (Ventola, 2011). Effective DTCA improve patient welfare by producing a more health conscious society, enhancing the doctor/patient relationship, and decreasing the number of under-diagnosed patients.

Cons

The average consumer does not have a medical background to help them interpret DTCA. DTCA can easily confuse and mislead consumers into having an incorrect impression of the effectiveness of a drug. Pharmaceutical companies must only list the drug's major risk factors.

The open interpretation of the term "*major*" risk factors enables a DTC ad to have an uneven list of risks and benefits. By withholding side effects and using vague descriptions, pharmaceutical companies could use DTCA to exaggerate the benefits of a drug (Ventola, 2011). Often DTC ads rely more on the use of emotional appeals than educating consumers about the medical condition and risks factors. Research shows that 95% of prescription drugs use emotional appeals in ads (Frosch et al., 2007). Instead of educating consumers, DTC advertisements use emotional appeals to convince people that a medication will improve consumers' lives. For example, not only do DTC ads portray medications as a cure to medical conditions, but it also portrays medication as a way for alleviating fear, calming distress, and gaining social approval for patients. DTCA promote inappropriate pharmaceutical drugs by exaggerating benefits, withholding pertinent information, and using misleading emotional appeals.

Brief Background

In 1969, the Food and Drug Administration (FDA) composed the first set of restrictions regarding DTCA, which required each prescription drug ad to contain a balanced account of all risks and benefits, a complete list of all side effects, and comply with formatting criteria. The amount of details demanded by the FDA made it difficult to promote medications through standard media channels. The facts could not be easily presented in the average length of a TV commercial or in the limited space of a one-page print ad. The pharmaceutical industry argued that the regulations put on DTCA prevented it from "*educating*" the public of medical treatment options. In August of 1997, the FDA released a temporary guidance that reduced the number of requirements for DTC broadcast advertising. Then in August of 1999 the FDA finalized the "*Industry Guidance on Consumer Directed Broadcast Advertisements*." From that point forward prescription advertisements only had to list the major side effects and give a location of supplementary information (Hartgraves, 2002).

DTC Regulations

The Food, Drug, and Cosmetic Act regulates direct to consumer drug advertisements. It is the responsibility of the U.S. Food and Drug Administration (2012, 2013) to monitor and enforce regulations on DTC advertisements. The FDA requires that DTC advertisements present a "*fair balance*" of the risks and benefits of prescription drugs. There are specific requirements set for print and broadcast direct to consumer advertisements. Print direct to consumer ads must contain a "*brief summary*" about the drug. The FDA defines a "*brief summary*" as a comprehensive explanation of the drugs positive and negative side effects. A "*brief summary*" should contain who should avoid taking the drug, when should someone discontinue using the drug, and what are the severe and routine side effects associated with the drug. Direct to consumer print ads usually have one whole page devoted just to the brief summary. Since the average television and radio commercial does not have the time available to present the extensive amount of information required in a brief summary, the FDA created the "*Guidance for Industry Consumer–Directed Broadcast Advertisements.*" The guidance stipulates what information must be disclosed in prescription human and animal drug broadcast advertisements. Direct to Consumer ads aired on television, radio, and telephone communications systems must provide the "*major statements*" and make "*adequate provisions*" about the prescription drug. The "*Major Statements*" consists of the presentation of drug's most important risks and side effects. This information must be included in the audio and can be accompanied by a visual in a television

commercial. There is no exact minimum or maximum set for the "*major statements*." The amount of risk information that must be included depends on the medication being advertised. Since the complete information about a drug cannot be relayed in a short television or radio ad, "*Adequate Provision*" must be provided. "*Adequate Provisions*" redirects viewers to where they can locate additional information about the drug. These provisions can be met by providing a web address, giving a toll-free telephone number, directing viewers to look at a specific print ad, and recommending that they consult a physician for question about the medication (FDA, 2012).

Mandatory Disclosures

To protect the public, the federal government requires "*fair balance*" disclosures of prescription drug side effects and benefits. Most industries are not required to mention the bad qualities of a product in its advertising. The government orders mandatory disclaimers for products that are harmful to the health of people. For instance, in the United States there is a mandatory Surgeon General Warning placed on all tobacco products. In the following section there will be a discussion of the history of the mandatory disclaimers put on tobacco products.

Tobacco

The U.S. federal government regulates cigarettes and smokeless tobacco advertising. On January 11, 1964, Luther L. Terry, M.D., Surgeon General of the U.S. Public Health Service, released a Report on Smoking and Health (Center of Disease Control and Prevention, 2009, 2012). For the first time the fact that smoking cigarettes can cause lung cancer was acknowledged. This revelation led to Congress enacting the Federal Cigarette Labeling and Advertising Act of 1965. The act required that all cigarette packaging and advertising have warning labels explaining that cigarettes are harmful to people's health. It was mandatory that the label read "*Caution: Cigarette Smoking May Be Hazardous to Your Health*" somewhere on the package or ad. Later congress made alterations to wording of the health warning should read. The Public Health Cigarette Smoking Act of 1969 mandated that the warning label should say "*Warning: The Surgeon General Has determined that Cigarette Smoking Is Dangerous to Your Health*" The act also banned cigarette advertising on television and radio. In 1984, congress passed the Comprehensive Smoking Education Act, which created a mandatory rotating health warnings system for all cigarette packaging and advertisements.

Cigarettes warning labels had to rotate through four different health warning every three months. The four updated warning labels consisted of the following: smoking causes lung cancer, heart disease and may complicate pregnancy; quitting smoking now greatly reduces serious rinks to your health; smoking by pregnant women may result in fetal injury, premature birth, and low birth weight; cigarette smoke contains carbon monoxide (CDC, 2012). Advertising for Smokeless tobacco has also been limited with regulations. In 1986, congress passed the Comprehensive Smokeless Tobacco Health Education Act. The act banned smokeless tobacco advertising on broadcast media and established three mandatory rotating warning labels. All smokeless tobacco packaging and advertisements were required to have one of the three following warning labels: this product may cause mouth cancer; this product may cause gum disease and tooth loss; and this product is not a safe alternative to cigarettes.

The cigarette and Smokeless tobacco industry are continually being met with new limitations and requirements. Most recently, the Family Smoking Prevention and Tobacco Control Act was made law on June 22, 2009. The Tobacco Control Act requires the cigarette and

smokeless tobacco packaging to have larger warning labels, additional warnings, and add visual images that warn smokers of the side effects of smoking. The warning labels must have larger font sizes. There will be none rotating warning messages that must be rotated. The warning messages will have images displaying the negative side effects of smoking. For example, a message that read "*Cigarettes cause fatal lung disease*" will be accompanied by a photo of an unhealthy lung. (FDA, 2013)

EXTANT LITERATURE ON PRESENTATION OF RISKS IN DTC ADS

There have been numerous research papers over the effectiveness of direct to consumer advertisements. The FDA requires that direct to consumer advertisements contain a "*fair balance*" presentation of the prescription drug side effects and benefits. A fair balance presentation requirement restrains advertisers from focusing attention on the benefits and understating side effects. Numerous content analyses have been conducted to assess the comparability of the presentation of side effects of benefits in direct to consumer advertising. The following section will summarize existing literature over communication formats and the validity of the "*fair balance*" presentation in direct to consumer advertisements.

Professor Joel Davis, from San Diego State University, conducted an experiment to see how the organization of risk and benefits in direct to consumer ads can alter how safe or effective a drug is regarded. The experiment entailed the creation of three fake prescription drugs that would treat three common illnesses. The numbers, the order, and the mode of the presentation of the side effects were adjusted to test how those factors influenced the customers' opinions on the severity of the side effects. The study concluded that the number of side effects and the mode of presentation influenced the customer reactions. For instance, the more side effects listed, the less safe the drug was regarded. Customers have a more positive attitude towards direct to consumer ads with oral communication of side effects compared to print. The order of the side effects in the list does not impact how customers judge the safety of a drug. However, the severity of a side effect impacts the customer's opinion of how often a side effect will takes place. Majority of the respondents believed that the more severe the side effect, the less likely it would occur (Davis & Meader, 2009).

Thorsen (2009) conducted a study to evaluate whether the presentation of risk and benefit information in direct to consumer broadcast advertisements followed the fair balance guidelines set by the FDA. He examined factors such as the number of statements assigned, the pace of the audio, the amount of time allotted, and the quantity of space given to the presentation of the risks and benefits. Direct to consumer advertisements that aired during the nightly news over a period of one month were collected from two different television networks. These samples were then analyzed. The data gathered showed that the number of risk statements did not equal benefit statements. All benefit statements and majority of the risk information were said at a steady normal pace. More time was allotted to the risk information than to the benefit information. The benefit information was shown in print larger and a more central location compared to the risk information (Thorsen, 2009). This research represents that direct to consumer advertisements do not always have a balanced presentation of warnings and benefits. The time, speed, space, and location all factor into how fairly information is presented.

This leads to the motivation for our study. There has been no study of an analysis of the vocal presentation of direct to consumer television advertisements till date in the literature. Our study aims to fill this important gap. We analyze the vocal communication of risks versus benefits in Direct-to-Consumer advertisements of prescription drugs. We compare the

differences between the vocal presentations of the drug risks compared to the presentation of drug benefits in DTC commercials. DTC commercials, ranging from the year 2000 to 2014. We then discuss the results (Wilkes et al., 2000).

METHODOLOGY

We observed a sample of DTC advertisements and gained an understanding of the components of DTC commercials. Then, we exported DTC TV ads from the internet using media software and converted the videos into audio files. We identified the Benefit and Risk messages contained in the voice track. The time duration of benefits and risks were documented. Then, a voice analysis of the advertisement during the benefits and risks was done. We employed state of the art procedures, described under "*Data Collection*", to measure the rate of speech, pitch range, duration, and quotient of the presentation of risk information compared to benefit information in each DTC advertisement. Then we examined the data collected and tested it for any relationships between the vocal presentation of the side effects of the drugs and the years the ads were produced and/or the severity of the ailments the drugs can treat.

Goal

We categorized the DTC commercials according to the severity of the ailment that the drug that is being advertised can treat (i.e. lifestyle drugs).

Benefits

A benefit is help provided by a drug for the person who is taking it. The law does not allow drug companies to advertise benefits unless they are related to the FDA-approved use. Benefits of prescription drugs can be used to control symptoms of difficult medical conditions, often pertaining to rare diseases, as well as medical concerns related to lifestyle segments and situations.

Risks

Risk covers information that answers the following issues/-What groups should not use the drug, when the drug should not be used, Serious and commonly occurring side effects, Side effects seen in special populations, the chance of dependency, the chance of, and withdrawal effects.

Expected Results

We hypothesize that the data will show that most DTC ads will emphasize the benefits of the medications by pronouncing the positive effects more clearly and at a higher volume compared to the risks of the medications. The benefits of the drugs will be said at a lower rate of speech, at a higher pitch, and at a higher vocal intensity. In contrast, the negative side effects will be spoken at a faster rate of speech, lower pitch, and lower vocal intensity. We predict that the severity of the ailment the prescription drug can treat will influence how the side effects are stated in a DTC commercial. The less life threatening the health concern, the faster and the quieter the negative side effects will be listed in a DTC add.

Data Collection

Speech production involves an intricate balance of systems and subsystems of our body. The audible output goes through a series of kinematic, aerodynamic, and acoustic modulations. Speakers convey their thought in a series of phrases that is relevant to the context involved and listeners interpret what they hear based on the semantics and syntax that was intended by the speaker. However, speakers can draw the attention of their audience based on how they manipulate their spoken utterance. The emotional component of speech can be influenced by several features. Johnstone & Scherer (2000) compiled acoustic features that reflected common emotions. Speech intensity, fundamental frequency, frequency variability, frequency range, sentence contour, and rate of speech were some of them. Intensity and frequency are the physical correlates of loudness and pitch. Frequency variability indicates pitch modulation which is inferred by plotting the sentence (pitch) contour and measuring pitch range across any given speech sample. Pitch range can be expressed in Hertz (Hz) as the difference between the highest and lowest frequency locations shown on a sentence contour. However, expressing this measure in semitones (ST) may be more accurate. For example, the range between 100 Hz and 200 Hz is the same as that between 1000 Hz and 2000 Hz because both 200 Hz and 2000 Hz are one octave (12 ST) away from 100 Hz and 1000 Hz, respectively. Rate of speech refers to the number of syllables uttered by the speaker in a given time, for instance, per second. Voice and speech analysis have become easier with technological advancement. Duration of risks and benefits were calculated by directly counting the number of seconds these contents were delivered. Based on this number and the duration of the ad, we have derived quotients for benefits and risks. Benefit Quotient is the ratio between the number of seconds spent for benefits divided by the total duration of the ad. Risk Quotient was similarly derived. The current study analyzed rate of speech in syllables per second, pitch range in semitones, benefit and risk time in seconds, and benefit and risk quotient in percentage (Figure 1A-E).

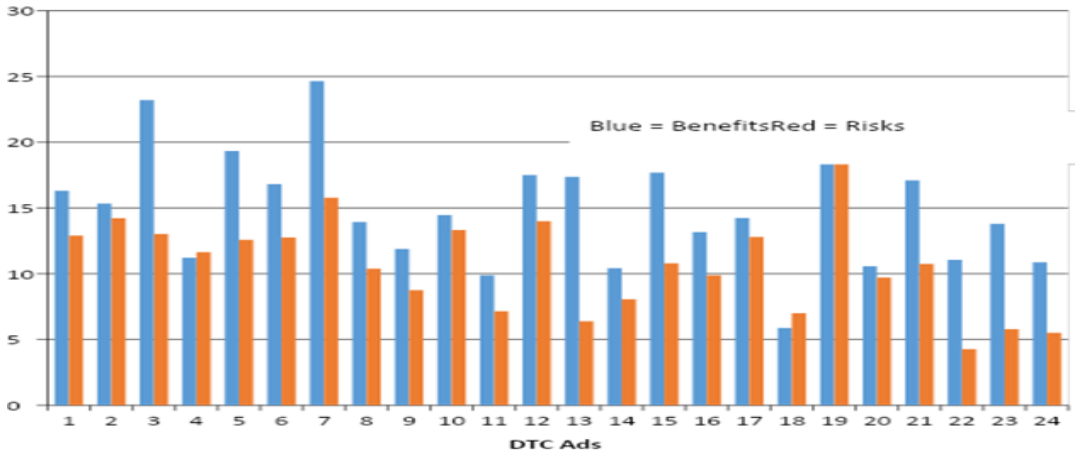

FIGURE 1A
BENEFITS VS RISKS - VOICE MODULATION IN SEMITONES

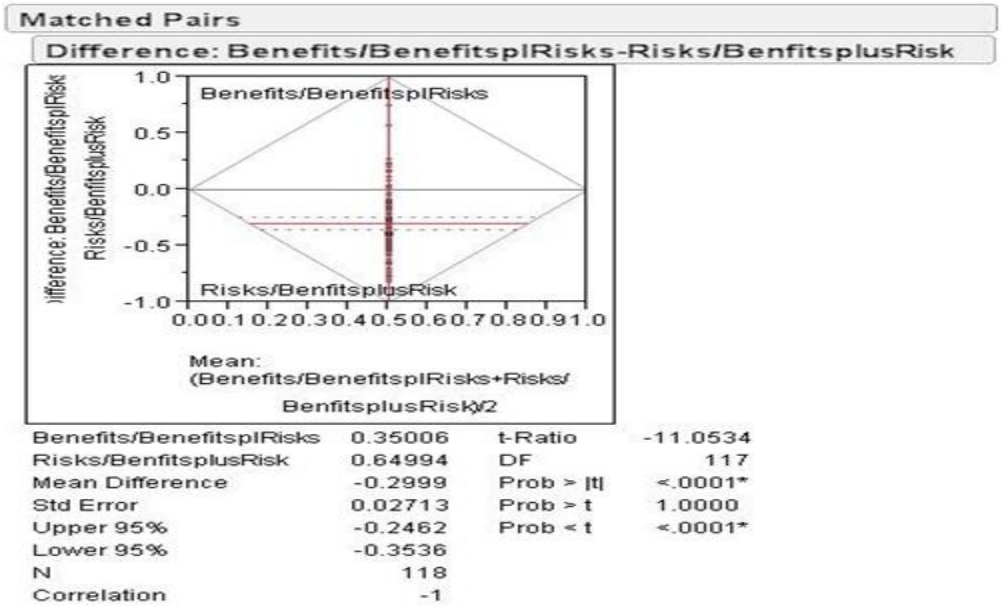

FIGURE 1B
MATCHED PAIRS BENEFITS BENEFITS RISKS/BENEFITS+RISKS

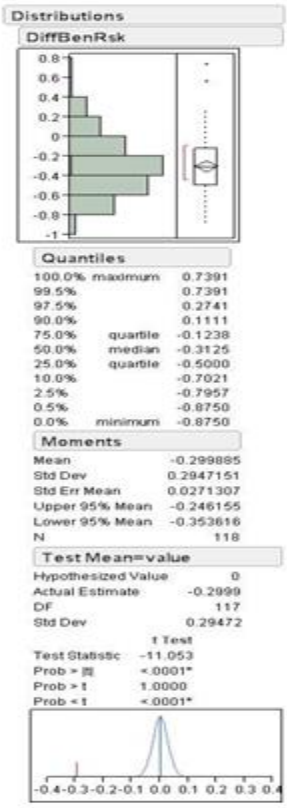

FIGURE 1C
DISTRIBUTION DIFFERENCES OF BENEFIT AND RISK

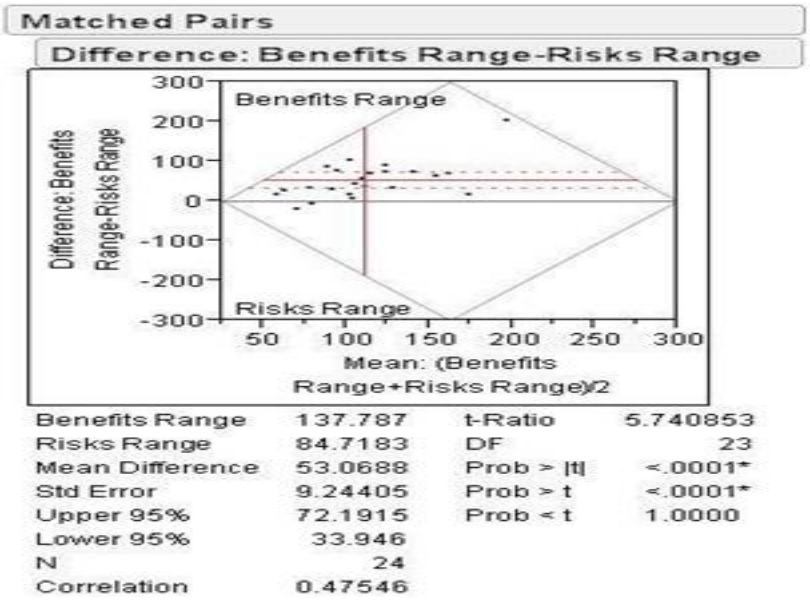

FIGURE 1D
MATCHED PAIRS DIFFERENCE: BENEFITS RANGE-RISKS RANGE

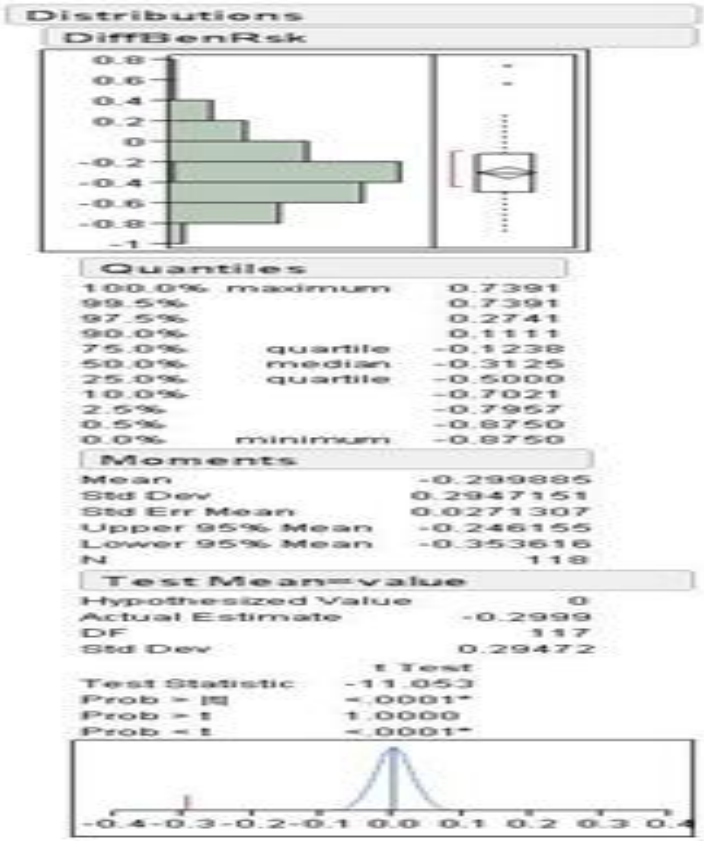

FIGURE 1E
DISTRIBUTION DIFFERENCES OF BENEFIT AND RISK

Methodology for Speech Analysis

The video files were converted to audio files using RealTimes Convertor, a free program downloaded from RealPlayer®. Based on the content of these audio files, the benefits and risks sections were marked as segments of interest. These segments were analyzed using Praat (version 5.3.56, Boersma & Weenink, 2014), software used for speech analysis. Praat extracts the sentence contour of speech and displays it as a frequency waveform across time. The waveform can be clicked at any location to evaluate the fundamental frequency of the narrator's voice. Figures 2 and 3 shows the sentence contours of a benefit and risk segment, respectively. The highest and lowest frequencies of each phrase were taken and the pitch range between these two frequencies was calculated in semitones. For example, if the highest frequency is 250 Hz and lowest is 125 Hz, the range in semitones will be 12 ST. The range calculated for phrases within each segment were averaged. Statistical analysis was performed between the mean pitch range calculated for benefits and risks. Results indicate that the pitch range is wider for benefits than risks. This suggests that narrators inflect their speech while discussing benefits. The rate of speech during these two segments, benefits and risks, were also calculated using the same software. These two segments were transcribed in the International Phonetic Alphabet (IPA). Number of syllables per utterance were calculated and divided by the duration in seconds. Results indicate that risks had a greater number of syllables than benefits. This suggests that narrators have a faster rate of speech while discussing risks.

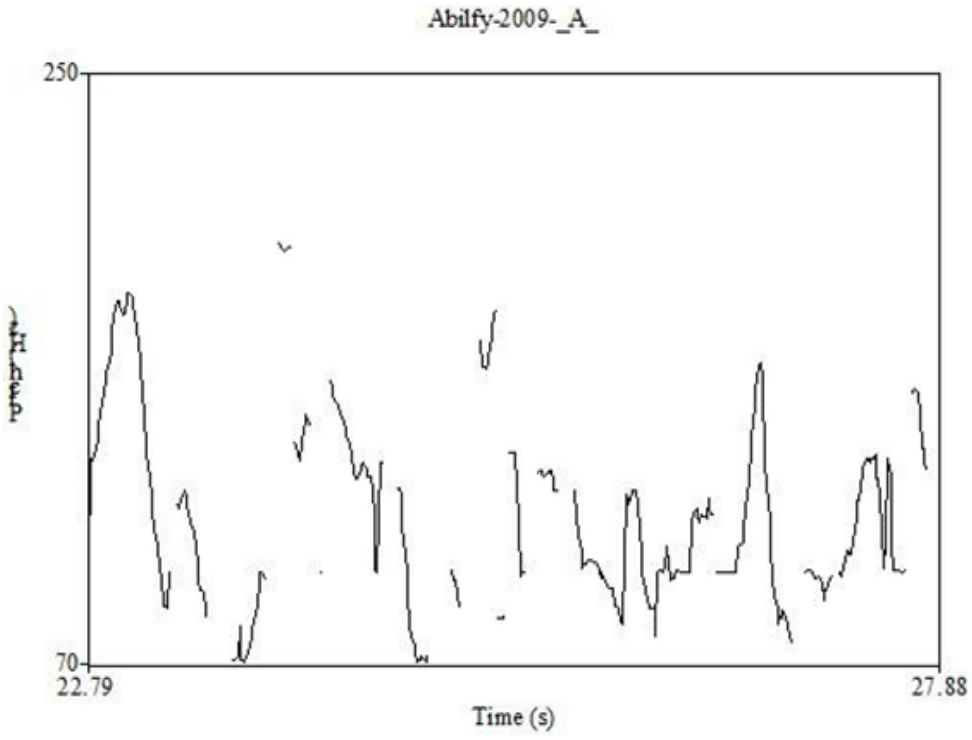

FIGURE 2
FREQUENCY CONTOUR OF BENEFITS

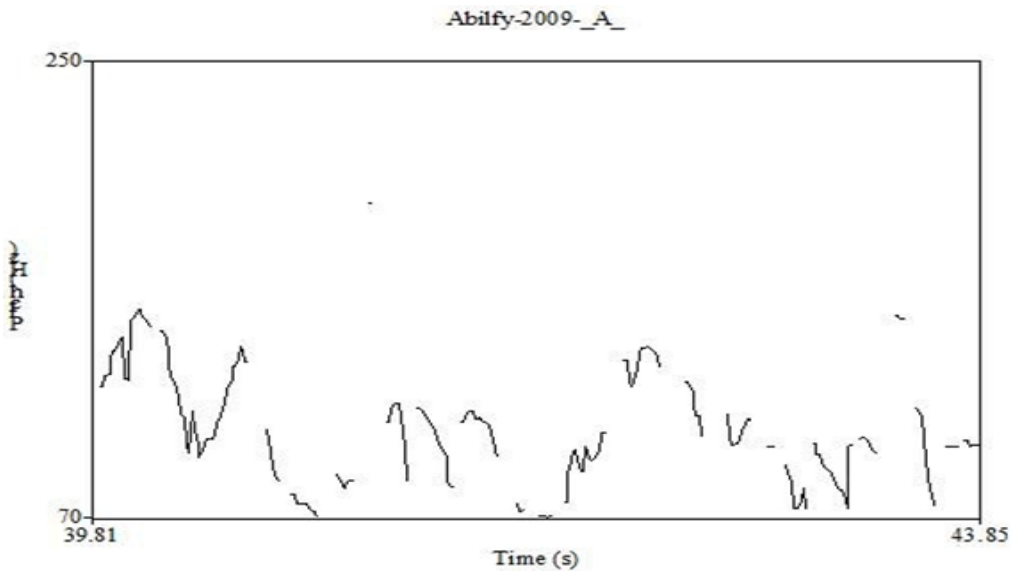

FIGURE 3
PITCH CONTOUR OF RISKS

RESULTS

Out of the 118 DTC ads measured, 117 of the ads devoted more time to the presentation of the drug risk information compared to the amount of time devoted to the presentation of the drug benefit information. The average rate of speech used to present the benefit information was 4.39 syllables/second. Whereas the average rate of speech used to present the risk information was 5.44 syllables/second. During pitch range calculation, music composition in most of the ads interfered with the narrator's delivery of benefits and risks. Only 37 ads were free from this hindrance and qualified for this analysis. The pitch range obtained from these ads revealed an average of 13.56 semitones for benefits and 9.13 for risk information.

Table 1
DIRECT TO CONSUMER ADVERTISING ANALYSIS

	Benefits	**Risks**
Rate of Speech	4.39 (0.32)	5.44 (0.28)
Pitch Range	13.56 (4.3)	9.13 (3.8)
Time	11.05 (5.1)	22.8 (10.8)
Quotient	17.75 (7.49)	35.08 (13.22)

The duration spent on risks; 22.8 seconds was greater than the time spent for benefits information (11.05). Similarly, the percentage of time spent on benefits and risks, identified as benefit quotient and risk quotient, were 17.75% and 35.08% in Table 1 and Table 2.

Table 2

Commercial ID	**Name Brand**	**Treatment**	**Year**	**Total Duration(minutes and seconds)**	**Content Description**
1	Ability	depression	2009	1:15	Depressed man and woman
2	Ability	depression	2010	1:15	Mom walking on a

					pier with family
3	Ability	depression	2011	1:30	Cartoon: Lady that fell into a hole
4	Ability	depression	2013	1:16	Cartoon: Lady at office and with family
5	Aciphex	Acid Reflux	2010	1:00	Father cooking
6	Aricept	Alzheimer's	2009	1:01	Grandmother with family
7	Aricept	Alzheimer's	2012	1:03	Airport Grandfather
8	Axiron	male hormone	2013	1:00	Backyard Birthday Party
9	Axiron	male hormone	2013	0:59	Baseball Umpire
10	Beyaz	birth control	2011	1:14(IC)	Women Shopping
11	Boniva	osteoporosis	2013	0:59	Sally Field sitting on a pier
12	Celebrex	inflammatio n	2007	2:28	Blue and white cyclist
13	Celebrex	inflammation	2008	1:00	Cartoon: Tennis player
14	Celebrex	inflammation	2013	1:30	Woman Swimming
15	Celebrex	inflammation	2013	1:30	Man walking his dog on the beach
16	Chantix	stop smoking	2009	2:32 (2:42)	Man reading in his garden
17	Chantix	stop smoking	2013	1:00	Father and son
18	Cialis	erectile dysfunction	2007	1:00	Parents and college age daughter
19	Cialis	erectile dysfunction	2012	1:00	Couple at a restaurant
20	Cialis	erectile dysfunction	2013	1:00	Couple playing tennis
21	Crestor	high cholesterol	2011	1:02	Man, on staircase
22	Crestor	high cholesterol	2011	1:00	Woman walking for exercise
23	Crestor	high cholesterol	2012	1:02	Man walking on a boardwalk
24	Crestor	high cholesterol	2012	1:01 (1:04)	White Woman wearing a purple top
25	Crestor	high cholesterol	2012	0.59 (1:00)	African American Woman wearing a purple floral top
26	Crestor	high cholesterol	2012	1:00	Grandmother with grand kids on the beach
27	Cymbalta	depression	2009	1:18(1:31)	Walking in the forest
28	Cymbalta	depression	2011	1:00	Woman sitting on a couch
29	Detrol LA	overactive bladder	2007	1:00 (1:20)	Woman in red at a BBQ
30	Detrol LA	overactive bladder	2008	1:04	Teacher with a bladder problem
31	Epiduo	acne	2013	1:00	Teenagers with acne

32	Exelon	dementia	2009	0:59	Daughter writing in journal
33	Flomax	BPH	2009	1:00	Men kayaking
34	Flomax	BPH	2010	1:00	Men running to the restroom
35	Humira	rheumatoid arthritis	2013	1:15	Woman at the Hair Salon
36	Humira	rheumatoid arthritis	2013	1:14(1:15)	Woman in the kitchen
37	Humira	rheumatoid arthritis	2013	1:14	Builder
38	Imitrex	migraine	2002	1:00	Nurse in the nursery
39	Imitrex	migraine	2002	1:01	Camping Lady
40	Imitrex	migraine	2003	1:00	Traffic
41	Imitrex	migraine	2003	1:00	Child riding bike
42	Imitrex	migraine	2005	1:00	On a date
43	Januvia	diabetes	2008	0:53(IC)	Walking up stairs
44	Latisse	eyelashes	2010	1:00	Blonde lady w/ blue
45	Latisse	eyelashes	2011	1:00(1:09)	Brooke Shields
46	Latisse	eyelashes	2013	1:01(1:05)	Mom, business lady
47	Levemir	diabetes	2012	1:00	Road trip
48	Lipitor	high cholesterol	2004	0:59	Man riding bike
49	Lipitor	high cholesterol	2009	1:01	Biking in the woods
50	Lipitor	high cholesterol	2010	0:59	Rope over rocks
51	Lipitor	high cholesterol	2011	0:59(1:04)	Sailing and scuba diving
52	Lipitor	high cholesterol	2011	1:01	Skating on thin ice
53	Lipitor	high cholesterol	2011	0.40(IC)	Couple hiking
54	Lunesta	insomnia	2006	0.58(1:00)	Butterfly flying around
55	Lunesta	insomnia	2011	1:00	Gives you wings
56	Lunesta	insomnia	2011	0:59	Hour after hour
57	Lunesta	insomnia	2012	1:00	Tossing and turning
58	Lunesta	insomnia	2013	0:59	Sleepy worried man
59	Lyrica	seizures, pain	2010	1:02(1:12)	Fashion Designer
60	Lyrica	seizures, pain	2013	1:00	Mother at a carnival
61	Lyrica	seizures, pain	2013	1:00(1:03)	Grocery shopping
62	Lyrica	seizures, pain	2013	1:14(1:15)	Man watering garden
63	Lyrica	seizures, pain	2013	1:00	Construction woman
64	Lyrica	seizures, pain	2013	1:15	Grandma with grandkids
65	Lyrica	seizures, pain	2013	1:00	Lady working at a bakery
66	Mirena	birth control	2008	0:59(1:03)	A lot happens in five yrs.
67	Mirena	birth control	2010	1:15	Kids playing in backyard
68	Nasonex	nasal allergies	2006	0:42	Bee and an owl
69	Nasonex	nasal allergies	2009	0.30(0:34)	Won't make you drowsy
70	Nasonex	nasal allergies	2009	0:30	A ticking clock
71	Nasonex	nasal allergies	2009	0:32	For his sweet
72	Nasonex	nasal allergies	2011	0:32	Bee and owl #2

73	Nasonex	nasal allergies	2013	0:45(0:58)	Pink flower petals
74	Nasonex	nasal allergies	2013	0:46	Allergy seasons
75	Nasonex	nasal allergies	2013	0:29	Flower blossom beckons
76	Nexium	GERD	2001	1:00	Rocky near the ocean
77	Nexium	GERD	2004	0:59	Talking about "*better*"
78	Nexium	GERD	2006	1:01	The "*finisher*"
79	Orencia	arthritis	2008	1:00	Can you grasp this?
80	Orencia	arthritis	2013	1:00	I want I can
81	Paxil	depression	2000	1:00	Offers new hope
82	Paxil	depression	2001	1:00	Talking about worry
83	Paxil	depression	2002	1:00	Used to be happy
84	Plavix	blood clots	2002	1:00	Grandfather fishing
85	Plavix	blood clots	2002	0:59	Better things to do
86	Plavix	blood clots	2003	1:00	A million hospitalized
87	Plavix	blood clots	2005	1:00	Bill the hockey coach
88	Plavix	blood clots	2008	1:14	Waiting to strike
89	Plavix	blood clots	2010	1:00	Woman golfer
90	Pradaxa	Afib, strokes	2011	1:16	Three doctors
91	Pradaxa	Afib, strokes	2014	1:15	Father goes visits doctor
92	Pristiq	depression	2010	1:15	
93	Provenge	cancer	2013	1:00	
94	Restasis	dry eyes	2009	0:58	
95	Restasis	dry eyes	2010	0:29	
96	Restasis	dry eyes	2010	1:01	
97	Rozerem	insomnia	2006	1:01	
98	Seroquel XR	depression	2011	1:30	
99	Spiriva	bronchospasm	2011	1:00	
100	Spiriva	bronchospasm	2011	1:00	
101	Spiriva	bronchospasm	2012	1:02	
102	Spiriva	bronchospasm	2013	1:00	
103	Spiriva	bronchospasm	2013	1:00	
104	Stelara	Psoriasis	2010	1:00	
105	Stelara	Psoriasis	2013	1:00	
106	Symbicort	asthma	2010	1:00	
107	Symbicort	asthma	2010	1:00	
108	Symbicort	asthma	2011	1:01	Green Truck
109	Symbicort	asthma	2011	1:00	Baseball Grandfather
110	Symbicor t	asthma	2012	0:59	Fisherman Grandfather
111	Tamiflu	flu	2012	1:01	Big man, small house
112	Vesicare	overactive bladder	2009	0:59	
113	Vesicare	overactive bladder	2010	1:00	
114	Vesicare	overactive bladder	2012	1:00	

115	Vesicare	overactive bladder	2012	1:02	
116	Viagra	erectile dysfunction	2011	0:57	Truck pulled by horses
117	Viagra	erectile dysfunction	2012	1:02	Man on a sailboat
118	Xeljanz	Rheum. arthritis	2013	1:30	Arms are made for hugs

DISCUSSION AND CONCLUSION

Contrary to expectations, more time was allocated to stating the risks in comparison to the benefits. However, the rate of speech was faster during the delivery of risks involved. This may have an influence on the listener. Faster speech could alter perceptual effects on a listener. Moreover, the pitch inflection of voice used for delivery of benefits was wider which could add as a factor of exaggeration and favor the content delivered. Furthermore, the quotients suggest that approximately 50% of the advertisements are fillers with music and description of the hypothetical patient. Based on these measures, the overall perception of an advertisement might have favored the benefits section than the risks. These results suggest the need for standardization in rate of speech for advertisements such that both benefits and risks of medication are perceived equally by the audience.

Future Work

We need to examine the changes in the regulatory environment, i.e. longitudinal study of the effects of FDA regulations on DTC advertisements. The next step would be to conduct a correlation test between the rate of speech and perception of listeners. The findings from this research gave us insight into how DTC advertisements are developed to influence the buying behavior of consumers. We were able to judge whether the risks of drugs are presented faster and less clearly in comparison to the benefits of drugs to suppress negative information that could deter consumption.

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