Fake News, Real Knowledge: The Impact of Food and Nutrition Messages on *The Daily Show with Jon Stewart*

Preliminary Research Findings
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EXECUTIVE SUMMARY

Research shows that entertainment has a major impact on knowledge, attitudes and behavior. How do the images of food in entertainment affect us? Is the “fake news” format of The Daily Show with Jon Stewart as effective as traditional news formats at delivering information about food and nutrition issues? This report outlines preliminary findings regarding the impact of “fake news” on viewers’ knowledge, attitudes and behavior related to nutrition and the food industry.

Participants aged 18 or older (N = 1619) were recruited by Qualtrics Panels, stratified by gender, age and race/ethnicity to approximately match the U.S. population and invited to take part in a study on news formats. They were randomly assigned to one of four experimental conditions:

1) A segment from The Daily Show with Jon Stewart that focused on the food industry’s conflicting messages around health and nutrition
2) A compilation of video news clips with the same information
3) A print news story with the same information
4) A control condition with no news story

Participants were asked about their knowledge of the topics covered in the news stories, attitudes regarding nutrition and the food industry and their intentions to improve their eating habits or learn more about the food industry in the next month. One month later, a sub-sample of the original participants (N = 799) completed a follow-up survey assessing knowledge, attitudes and intentions, as well as support for stronger regulations on the food industry, eating behavior and seeking and sharing information about nutrition and the food industry.

Preliminary results suggest people who saw The Daily Show story remembered more information, became more cynical toward the food industry and a month later, ate more fruits and vegetables than those who saw the video or print news story. Among “millenials,” the The Daily Show condition was less effective than video or print news at influencing attitudes (trust in the food industry) and intentions (improving eating habits, supporting stronger regulations). However, for those who had previously seen The Daily Show before participating in this study (who were already highly cynical about the food industry), viewing this Daily Show segment gave them a sense that changing the food industry is possible and a month later, resulted in less frequent consumption of foods high in sugar.
INTRODUCTION

An abundance of research shows that entertaining stories exert substantial effects on knowledge, attitudes and behavior (e.g., Brodie et al., 2001; Collins et al., 2003; Hether et al., 2008; Morgan et al., 2009; Valente et al., 2007). Through a process known as transportation (Green & Brock, 2000, 2002), we become absorbed into stories—transported, so to speak, to another time or place. We may lose track of the passage of time or forget our surroundings, feeling as if we have become part of the story. In this state, it is believed that our cognitive defenses are lowered and we are more easily influenced by entertainment messages, for better or for worse (e.g., Moyer-Gusé, 2008; Slater & Rouner, 2002).

Food is incredibly prevalent in entertainment media. A content analysis of popular prime time TV shows from 2004-2013 (Rosenthal, 2015) found eight in ten episodes had at least one depiction of food, and characters were more likely to be seen eating junk food than fruits and vegetables. We know that people are influenced when they see characters similar to them modeling healthy or unhealthy behaviors (e.g. Bandura, 1986, 2002, 2004). Thus, when viewers see their favorite TV characters consuming unhealthy food, they may be more likely to pick up (or continue) unhealthy eating habits themselves. But what if the entertainment industry’s expert storytellers chose to use their power and influence to inspire audiences to make healthier food choices?

Enter The Daily Show with Jon Stewart. After taking over as host of The Daily Show in 1999, Stewart patented the satirical entertainment news format, paving the way for later variations such as The Colbert Report and Last Week Tonight with John Oliver. At its peak in 2008, The Daily Show averaged two million viewers per episode (Starr, 2008). Stewart himself long claimed that his show was in the business of “fake news,” but is this an accurate assessment?

A growing scholarly literature has emerged in recent years examining The Daily Show and other entertainment news programs (e.g., Baumgartner & Morris, 2006; Baym, 2005; Xenos & Becker, 2009). A 2007 Pew Research Center study (Kohut, Morin, & Keeter) found that viewers of The Daily Show and The Colbert Report were more knowledgeable about politics and world events than viewers of any other news source. However, because relatively few of these studies utilize experimental methods, it has been difficult to ascertain whether these programs actually make viewers more informed, or whether the type of people who watch these shows are more informed to begin with. One experimental study (Kim & Vishak, 2008) found comedy to be less effective than traditional news in terms of conveying political information. Another study (Xenos & Becker) suggests The Daily Show can serve as a “gateway” to more traditional “hard” news, motivating further information-seeking. The vast majority of
research on entertainment news focuses knowledge of large-scale domestic and foreign policy issues. To our knowledge, no research thus far has addressed the impact of satirical or entertainment news on viewers’ attitudes and behavior in relation to personal health.

Near the end of Stewart’s final season, *The Daily Show* ran a segment titled “The Snacks of Life” (March 17, 2015; [http://thedailyshow.cc.com/videos/fsdtvk/the-snacks-of-life](http://thedailyshow.cc.com/videos/fsdtvk/the-snacks-of-life)) skewering the increasingly unhealthy options offered by major food companies alongside the food industry’s conflicting messages to consumers around health and nutrition (Figure 1).

**Figure 1**
Excerpt from “The Snacks of Life” segment

As evidence mounts that Big Agra and the food lobby have turned our food supply into an addictive, fattening death menu of artificial chemicals, antibiotics and cool ranch carcinogens, the question is…now that the American people are aware of this, what are food companies going to do about it?

...It appears they’re going to say [bleep] you anyway.

We conducted an experimental study to gauge the effectiveness of this *Daily Show* segment in comparison to traditional video and print news formats. We were interested in investigating not only what type of news had the most influence on viewers’ knowledge, attitudes and behavior in relation to nutrition and the food industry, but also what individual characteristics (e.g., age and prior history with *The Daily Show*) might amplify or attenuate this influence.
METHODS

Research Design

The study utilized an experimental design with a sample of U.S. adults aged 18 or older. Participants were recruited by Qualtrics Panels, a third-party vendor for market research panels, and stratified by gender, age and race/ethnicity to approximately match the demographics of the U.S. population. They were invited to take part in a study of different news formats and randomly assigned to one of four experimental conditions:

1) **The Daily Show**: A segment from *The Daily Show with Jon Stewart* addressing the food industry’s conflicting messages around health and nutrition
2) **Video News**: A compilation of video news clips containing the same information
3) **Print News**: A print news story containing the same information
4) **Control**: No news story

The video and print news pieces were developed by the research team to ensure that they provided the same information as *The Daily Show* segment, but delivered in a straightforward manner, without satire. The video news condition consisted of news clips and commercials, in most cases the same ones featured in *The Daily Show* segment. The print news story was written by the researchers to match the content of the other conditions, while staying within the conventions of traditional print journalism.

**Figure 2**
Screen shot of a portion of print news story
Two rounds of data collection were conducted: a post-test immediately following the experimental stimuli (wave 1) and a follow-up post-test one month later (wave 2) to measure knowledge, attitudes and behavior as a result of exposure to the different news stories. A total of $N = 1619$ participants completed the wave 1 survey and $N = 799$ of the original participants completed wave 2 (Table 1). The University of Southern California IRB reviewed and granted exemption to this study.

Table 1
Sample Characteristics

<table>
<thead>
<tr>
<th></th>
<th>Wave 1 (N = 1619)</th>
<th>Wave 2 (N = 799)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Age</td>
<td></td>
<td></td>
</tr>
<tr>
<td>18-24</td>
<td>10.9%</td>
<td>5.6%</td>
</tr>
<tr>
<td>25-44</td>
<td>35.0%</td>
<td>27.5%</td>
</tr>
<tr>
<td>45-64</td>
<td>35.7%</td>
<td>42.9%</td>
</tr>
<tr>
<td>65+</td>
<td>18.3%</td>
<td>23.9%</td>
</tr>
<tr>
<td>Median Age</td>
<td>48.0</td>
<td>55.0</td>
</tr>
<tr>
<td>Gender</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Male</td>
<td>48.2%</td>
<td>47.7%</td>
</tr>
<tr>
<td>Female</td>
<td>51.8%</td>
<td>52.3%</td>
</tr>
<tr>
<td>Race/Ethnicity</td>
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<td></td>
</tr>
<tr>
<td>White</td>
<td>77.9%</td>
<td>79.8%</td>
</tr>
<tr>
<td>Black</td>
<td>8.6%</td>
<td>8.8%</td>
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<tr>
<td>Hispanic/Latino</td>
<td>8.6%</td>
<td>7.3%</td>
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<tr>
<td>Asian/Pacific Islander</td>
<td>3.2%</td>
<td>2.4%</td>
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<tr>
<td>Other</td>
<td>1.7%</td>
<td>1.8%</td>
</tr>
<tr>
<td>Marital Status</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Never married</td>
<td>25.3%</td>
<td>22.3%</td>
</tr>
<tr>
<td>Married or living together</td>
<td>59.7%</td>
<td>58.3%</td>
</tr>
<tr>
<td>Other</td>
<td>14.9%</td>
<td>19.3%</td>
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<tr>
<td>Education</td>
<td></td>
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<tr>
<td>High School or less</td>
<td>18.0%</td>
<td>20.5%</td>
</tr>
<tr>
<td>Some college</td>
<td>37.6%</td>
<td>38.1%</td>
</tr>
<tr>
<td>Bachelor’s degree</td>
<td>28.3%</td>
<td>29.5%</td>
</tr>
<tr>
<td>Graduate degree</td>
<td>16.0%</td>
<td>11.9%</td>
</tr>
<tr>
<td>Ever watched The Daily Show</td>
<td></td>
<td></td>
</tr>
<tr>
<td>No</td>
<td>55.1%</td>
<td>58.9%</td>
</tr>
<tr>
<td>Yes</td>
<td>44.9%</td>
<td>41.1%</td>
</tr>
<tr>
<td>Condition</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Daily Show</td>
<td>25.1%</td>
<td>24.0%</td>
</tr>
<tr>
<td>Video News</td>
<td>24.9%</td>
<td>22.3%</td>
</tr>
<tr>
<td>Print News</td>
<td>23.1%</td>
<td>25.0%</td>
</tr>
<tr>
<td>Control</td>
<td>26.9%</td>
<td>28.7%</td>
</tr>
</tbody>
</table>

Note: Some percentages do not equal or exceed 100% due to rounding.
Measures

A survey questionnaire assessing knowledge, attitudes and intentions related to the topics in the news stories was administered immediately following exposure to the experimental stimuli (wave 1; April 22 to May 7, 2015) and again approximately one month later (wave 2; May 28 to June 2, 2015). In addition to knowledge, attitudes and intentions, the wave 2 survey assessed eating behavior, support for stricter regulations on the food industry and other behavior such as searching for or sharing information about nutrition or the food industry.

Knowledge

The primary knowledge outcome of interest related to a key piece of information in all three news stories about Kraft Singles obtaining a “Kids Eat Right” label from the Academy of Nutrition and Dietetics (shown in Figure 3).

Figure 3
Kids Eat Right label with relevant excerpt from The Daily Show and video news stories

The Academy [of Nutrition and Dietetics] has a program called ‘Kids Eat Right’… They entered into an agreement with Kraft, where Kraft is ... giving money to the academy to support this program and in exchange they get to put this label on their product… So Kraft is paying the academy.

At both survey waves, participants were asked “How did Kraft Singles get a ‘Kids Eat Right’ label from the Academy of Nutrition and Dietetics,” and provided four response options, of which the correct answer was “Kraft gave money to support the Academy’s ‘Kids Eat Right’ program.”

Attitudes

Key attitudinal outcomes included cynicism and trust toward the food industry and hopefulness about changing the food industry. All attitudinal items were rated on a Likert scale from 1 (strongly disagree) to 5 (strongly agree) and assessed at wave 1 and 2. Six items measured cynicism toward the food industry (wave 1 $\alpha = .87$; wave 2 $\alpha = .88$), including “In general, the food industry does not seem to care about my health.”
and “I find myself angered by a number of food industry marketing practices.” Two items addressed trust in the food industry (wave 1 $\alpha = .67$; wave 2 $\alpha = .71$), which was negatively correlated with—but not simply the reverse of—cynicism (wave 1: $r = - .30$; wave 2: $r = - .40$). These were: “In general, I trust the food industry to tell the truth” and “In general, I don’t believe the food industry is putting profits ahead of my health.” Finally, three items tapped into a sense of hope that it is possible to change the food industry (wave 1 $\alpha = .71$; wave 2 $\alpha = .71$), including: “There is very little we as a society can do to fight back against food industry practices that we oppose” (reversed) and “Individuals can send a message to the food industry through their purchasing decisions.”

**Eating Intentions**

Participants in both survey waves were asked to indicate the likelihood, from 1 (very unlikely) to 5 (very likely) of improving each of 15 eating habits in the next month. Sample items included: “Reduce sugar consumption” and “Eat more fruits and vegetables.” These 15 items formed a highly reliable scale (wave 1 $\alpha = .96$; wave 2 $\alpha = .96$). All items included an additional “not applicable to me” option.

**Eating Behavior**

At wave 2 only, participants were asked how often in the last month they actually consumed each of the 15 types of food described above, from 1 (no more than once) to 5 (multiple times a day). Items were assessed individually.

**Policy Support**

At wave 2 only, participants were asked to indicate their likelihood, from 1 (very unlikely) to 5 (very likely) of voting for or supporting stronger regulations on the food industry in the next two years (7 items: wave 1 $\alpha = .96$; wave 2 $\alpha = .96$). Items included: “Support warning labels on food packaging similar to those on tobacco products” and “Vote for candidates who support regulations requiring food companies to disclose financial relationships.”
Analysis

For each of the measures described above, we analyzed the main effect of condition (i.e., was there an overall difference between conditions?), as well as interactions between condition and other variables such as age and prior history with The Daily Show (i.e., was the difference between conditions limited to certain subgroups of people or larger for some than others?).

To analyze interactions between condition and age, participants were split into two groups: those between the ages of 18 and 34 (i.e., “millenials”) and those aged 35 or older.

Prior history with The Daily Show was assessed with the question “Not including today, how often do you watch The Daily Show with Jon Stewart either on TV or online?” The options were never, rarely, occasionally, frequently and all the time. To analyze potential interactions with condition, this variable was collapsed into two categories: those who had ever watched The Daily Show before participating in this experiment (viewers) and those who had never before seen the show (non-viewers).
KEY FINDINGS

Only select findings are reported here. These findings were presented in part at Hollywood and Dine: The Image and Impact of Food In Entertainment at Expo Milano 2015.

Main Effects of Condition

Knowledge

As shown in Figure 4, when asked how Kraft got the “Kids Eat Right” label, 35% of participants in the control condition answered correctly; these were people who either guessed correctly or already knew the answer. Those assigned to The Daily Show condition were more than twice as likely to answer correctly as control participants, and about 20% more likely to answer correctly than those in the video or print news conditions. The difference between The Daily Show condition and the video and print news conditions was highly significant.

![Figure 4: Percent Correct: How did Kraft Singles get a ‘Kids Eat Right’ Label?](Wave 1; N = 1617)

Daily Show vs. Video vs. Print: \(\chi^2(2) = 25.95, p < .001\), Cramer's V = .15

Attitudes

At wave 1, participants in The Daily Show condition had significantly greater cynicism toward the food industry than those in the video or print news conditions (Figure 5), and
significantly less trust in the food industry, compared to those in the video condition (Figure 6).

**Figure 5**
*Mean Cynicism Toward Food Industry, 1-5*
*(Wave 1; N = 1618)*

![Bar chart](image)

Daily Show vs. Video vs. Print: $F(2,1179) = 6.11, p = .002, \eta^2 = .010$

**Figure 6**
*Mean Trust in Food Industry, 1-5*
*(Wave 1; N = 1618)*

![Bar chart](image)

Daily Show vs. Video vs. Print: $F(2,1179) = 10.55, p < .001, \eta^2 = .018$
**Behavior**

At wave 2, participants assigned to *The Daily Show* and video news conditions reported eating fruits and vegetables significantly more often than those in the print news condition (Figure 7). There was no significant difference between the two videos.

![Figure 7](image)

*Mean Frequency of Eating Fruits and Vegetables, 1-5 (Wave 2; N = 799)*

<table>
<thead>
<tr>
<th>Condition</th>
<th>Mean Frequency</th>
</tr>
</thead>
<tbody>
<tr>
<td>Control</td>
<td>3.14</td>
</tr>
<tr>
<td>Print</td>
<td>3.11</td>
</tr>
<tr>
<td>Video</td>
<td>3.44</td>
</tr>
<tr>
<td>Daily Show</td>
<td>3.35</td>
</tr>
</tbody>
</table>

Daily Show vs. Video vs. Print: \( F(2,567) = 4.29, p = .014, \eta^2 = .015 \)

**Interactions**

For many of the outcome variables, there were no overall differences between experimental conditions news pieces. However, patterns in the data became apparent when we examined interactions between condition and other variables such as age and prior history with *The Daily Show*.

**Age by Condition**

There were no significant differences between conditions for participants aged 35 or older. The outcomes for older participants were the same whether they saw *The Daily Show* segment or the video news clip or the print article.
Among 18-34 year olds, however, several outcomes at follow-up (wave 2) were significantly influenced by news format:¹

- Trust in the food industry was lower among those who saw the video news than *The Daily Show* or print news conditions (**Figure 8**);
- Intentions to improve eating habits were greater for those in the print news condition than *The Daily Show* (**Figure 9**); and
- Participants in the video and print news conditions had stronger support for regulations on the food industry, relative to *The Daily Show* condition (**Figure 10**).

In other words, *The Daily Show* was less effective than straight video or print news at influencing attitudes and intentions among millennials.

**Figure 8**

*Mean Trust in Food Industry, 1-5, Condition x Age (Wave 2; N = 570)*

Daily Show vs. Video vs. Print (18-34): $F(2,123) = 3.23, p = .043, \eta^2 = .050$

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¹ For clarity of presentation, only the three experimental conditions are shown in the charts that follow.
**Figure 9**
*Mean Intentions to Improve Eating Habits, 1-5, Condition x Age (Wave 2; N = 566)*

Daily Show vs. Video vs. Print (18-34): $F(2,123) = 3.58$, $p = .031$, $\eta^2 = .055$

**Figure 10**
*Mean Support for Stricter Regulations, 1-5, Condition x Age (Wave 2; N = 569)*

Daily Show vs. Video vs. Print (18-34): $F(2,123) = 4.82$, $p = .010$, $\eta^2 = .073$
Prior History with *The Daily Show* by Condition

Among non-viewers, those assigned to *The Daily Show* condition were significantly more cynical toward the food industry than those in the video or print news conditions (Figure 11). There were no significant differences in cynicism among prior viewers of *The Daily Show*, who were highly cynical regardless of what they saw. In fact, non-viewers who were assigned to watch *The Daily Show* emerged equally cynical to prior viewers.

**Figure 11**

*Mean Cynicism Toward Food Industry, 1-5, Condition x Prior History (Wave 1; N = 1182)*

Despite their high levels of cynicism, prior viewers of *The Daily Show* who were assigned to *The Daily Show* or print conditions felt a greater sense of hope that it is possible to change the food industry, relative to those who saw the video news (Figure 12). There was no significant difference on this variable among non-viewers of *The Daily Show*, who were overall more hopeful than viewers. In other words, among previous viewers, *The Daily Show* segment attenuated the sense that fighting the food industry is a hopeless endeavor.
At wave 2, among prior viewers, those assigned to The Daily Show condition consumed foods high in sugar less often than those in the video news condition (Figure 13). Again, there was no significant difference among non-viewers.

**Figure 13**

*Mean Frequency of Eating Foods High in Sugar, 1-5, Condition x Prior History (Wave 2; N = 570)*

Daily Show vs. Video vs. Print (viewers): $F(2,231) = 6.60, p = .002, \eta^2 = .054$
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HOLLYWOOD, HEALTH & SOCIETY

Hollywood, Health & Society (HH&S) is a program of the Norman Lear Center at the University of Southern California's Annenberg School for Communication and Journalism. Established in 2001, HH&S provides entertainment industry professionals with accurate and up-to-date information for storylines dealing with health and climate change through consultations and briefings with experts. Funded by the Centers for Disease Control and Prevention, The California Endowment, the Bill & Melinda Gates Foundation and The SCAN Foundation, among others, the program recognizes and studies the profound impact of entertainment on behavior. For more information, go to www.hollywoodhealthandsociety.org.

THE NORMAN LEAR CENTER

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