

Analysis of personal attribute relationships based on online research and social data

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Although social data can be an important source of information for studying personal attributes, it remains unclear which kinds of attributes can be inferred from social data and meaningfully used in the social sciences. In response, we analyzed the relationships between a variety of attributes, including political alignment, morality, food identity, and brand preferences, based on social data (i.e., Twitter text) and online survey data. Our results revealed a relationship between political alignment (liberal and conservative) and morality, food identity, and brand preferences. In addition, liberal people were more likely to belong to the food left-wing category. As for brand preferences, the conservative people showed a higher preference for Japanese companies than liberal people.

1. Introduction

Although inferring personal attributes from social data is important in research in the social sciences as well as application in social media, complex relationships in person attributes remain unstudied. In our research, we analyzed social data—namely, the tweets of Twitter users—in relation to their personal attributes, as identified by an online survey. In particular, we investigated the relationships between each user's political alignment, morality, food identity, and brand preferences (Fig. 1).

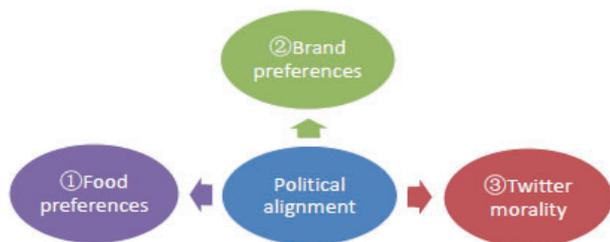


Figure 1. Research Diagram

The framework for our research draws from two important concepts. The first, Moral Foundations Theory developed by Jonathan Haidt [1], holds that every person innately has five moral foundations that allow him or her to intuitively judge moral situations. They are:

- Harm (i.e., disliking the pain of others and feeling responsible for protecting vulnerable people);
- Fairness (i.e., taking the right or just action based on accepted rules);
- Ingroup loyalty (i.e., being loyal to social ingroups, including family and nation);
- Authority (i.e., respecting and obeying tradition and legitimating authority);
- Purity (i.e., feeling antipathy for disgusting things and contamination).

We measured those five moral foundations in Japanese-language texts with reference to the Japanese Moral Foundations Dictionary (J-MFD) [2].

The second concept is food identity, which at base proposes two types of people. Whereas proponents of the so-called “food left-wing” typically advocate natural foods and health consciousness (e.g., vegetarians and vegans), proponents of the so-called “food right-wing” generally consume any available food products and enjoy eating fast food. Sasahara (2018) has shown that food identity can serve as an appropriate proxy for personal attributes and can offer insights into potential buying patterns [3].

Mobilizing those two concepts, we examined the relationship between the self-reported political alignment and food identity, brand preferences, and morality.

2. Method

2.1 Data

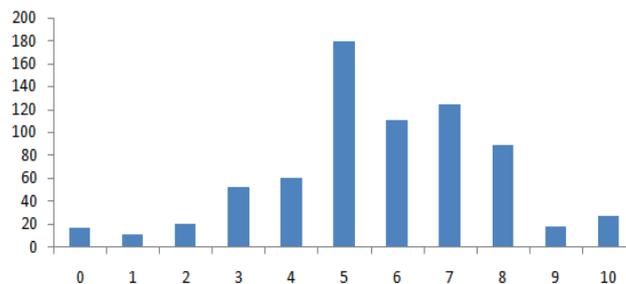


Figure 2. Distribution of users with different political alignment on an 11-point scale (0: very liberal, 10: very conservative)

First, we gathered the responses of a sample of 703 participants from online users to a questionnaire addressing political alignment, food preferences, and brand preferences in statements that participants rated on an 11-point scale (0 = *very liberal*, 10 = *very conservative*). Participants also indicated their political alignment on the same scale (Fig. 2). We placed ones whose scores ranged from 0 to 2 in the liberal group and ones whose scores ranged from 8 to 10 in the conservative group. As we were only focusing on people from these two groups, we excluded the ones whose scores ranged from 3 to 7.

Second, upon receiving permission from the participants, we also collected Twitter data representing each user by using Twitter’s API. After gathering all posts (i.e., tweets, retweets, and replies) from 650 active Twitter accounts with more than 2,000 posts, we quantified the tweets in terms of moral foundations based on the J-MFD.

2.2 Data Analysis

We analyzed the relationships among political alignment, food identity, and brand preferences as indicated in the questionnaire data for each group of participants (i.e., the liberal group and the conservative group). Our calculations prioritized the value of political alignment in identifying links among other attributes.

For morality analysis, we used MeCab to separate Japanese-language texts into words and extracted the moral loadings from each participant’s tweets with reference to the J-MFD. The moral loading was the percentage of words in the J-MFD also used in tweets. Based on the moral loading, we pinpointed aspects of morality in relation to political alignment.

3. Results

Figure 3 shows the relationship between political alignment and food preferences, the latter of which we divided into three types: fast food (i.e. food right-wing), healthy food (i.e., food left wing), and basic food (i.e., base ingredients). Our results reveal a relationship between political alignment and food preferences; liberal people prefer healthy foods more than conservative ones, whereas conservative people prefer fast food more than liberal ones. The groups did not indicate a significant difference in preferences for basic food.

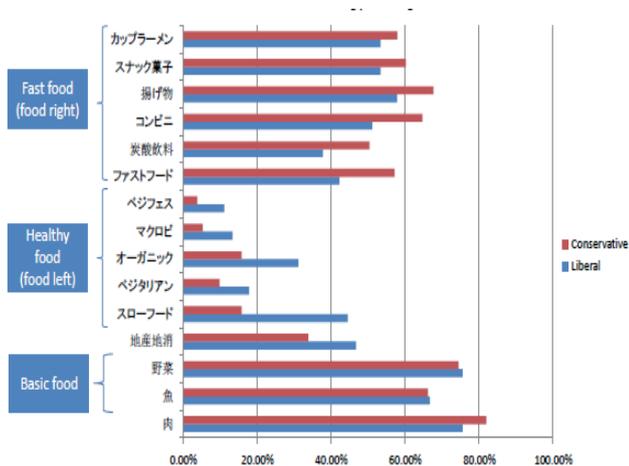


Figure 3. Food liking percentage

We also analyzed the difference in preferences for specific brands between the two groups. Companies from Japan such as Nissan and Toyota were more preferred in the conservative group, whereas the majority of participants who preferred popular brands such as IKEA and Facebook were in the liberal group (Fig. 4).

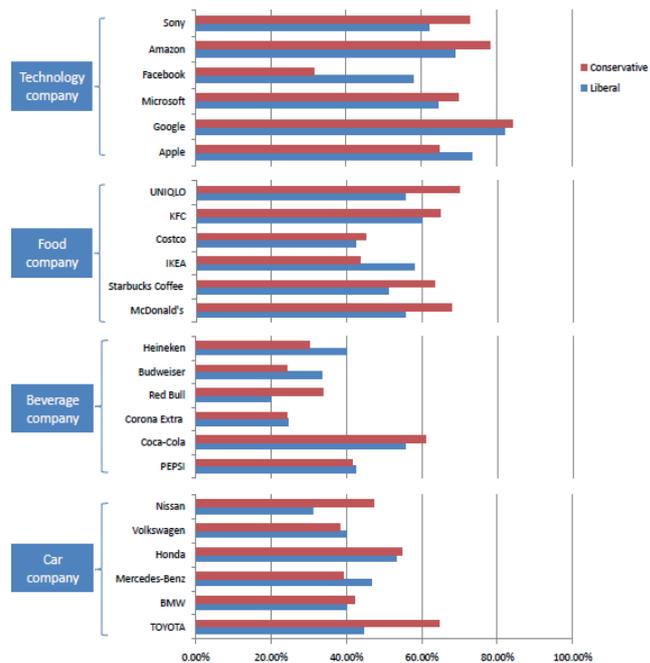


Figure 4. Brand liking percentage

To measure moral loadings, we separated tweet texts into words and computed the frequencies of words related to “virtue” and “vice” as defined in the J-MFD. Figure 5 shows that participants in the liberal group had higher virtue loadings than ones in the conservative group in most of the foundations except purity. Furthermore, the frequencies of virtue words related to ingroup and authority were greater than any of the other moral foundations. By contrast, vice-related words indicated harm more than any other moral foundation (Fig. 6), with fairness, with the minimum proportion, as a remote second. By political alignment, participants in the liberal group had higher vice-related moral loadings for all of the five moral foundations, especially for harm and fairness.

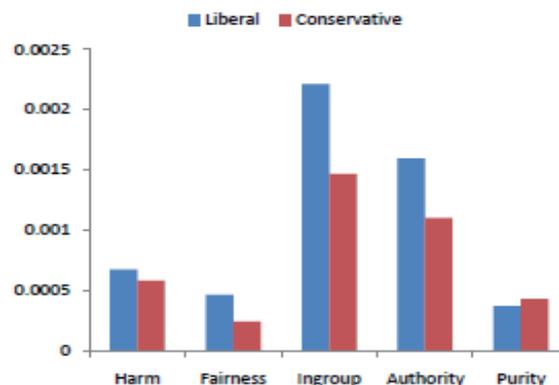


Figure 5. Virtue loadings by moral foundation

