

You Read What You Value: Understanding Personal Values and Reading Interests

Gary Hsieh

Human Centered Design & Engineering
DUB group, University of Washington
garyhs@uw.edu

Jilin Chen, Jalal Mahmud, Jeffrey Nichols

IBM Almaden Research Center
650 Harry Road, San Jose, CA 95120, USA
{jilinc, jumahmud, jwnichols}@us.ibm.com

ABSTRACT

This paper presents an experiment on the relationship between personal values and reading interests of online articles. Results suggest that individuals' values can predict their topical interests. For example, holding stronger universalism values predict interests towards environmental articles, whereas holding stronger achievement values predict interest towards work-related articles. Findings demonstrate the possibility of targeting based on individuals' personal values, but also highlight certain challenges and limitations when applying this approach for online content.

Author Keywords

Personal values; reading interest; Twitter; content targeting

ACM Classification Keywords

H.5.3. Group and Organizational Interfaces: Computer-supported cooperative work.

INTRODUCTION

Personal values convey what is important to us. By definition, they are “deeply rooted, abstract motivations that guide, justify or explain attitudes, norms, opinions and actions” [5]. They underlie and influence individual behaviors, from choice of college major, consumer decisions, religiosity, etc (see Schwartz et al. [5]). More recently the study of values and behaviors have also been extended to the online context, where values have been shown to predict word usage in online posts [1].

In this work, we aim to build on this body of research by exploring whether values may also influence the types of textual content that we are interested in consuming online. If demonstrated, the influence of personal values on an individual's topical interests could contribute to valuable applications such as online content recommendation, where existing techniques (e.g. content similarity, collaborative filtering and social network structure, see Jannach et al. [2]

Permission to make digital or hard copies of all or part of this work for personal or classroom use is granted without fee provided that copies are not made or distributed for profit or commercial advantage and that copies bear this notice and the full citation on the first page. Copyrights for components of this work owned by others than the author(s) must be honored. Abstracting with credit is permitted. To copy otherwise, or republish, to post on servers or to redistribute to lists, requires prior specific permission and/or a fee. Request permissions from permissions@acm.org.

CHI 2014, April 26 - May 01 2014, Toronto, ON, Canada.

Copyright is held by the owner/author(s). Publication rights licensed to ACM.

ACM 978-1-4503-2473-1/14/04...\$15.00.

<http://dx.doi.org/10.1145/2556288.2557201>

for a review) are mostly agnostic about people's deeper motivations.

Existing research on personal values suggest that upholding certain values motivate people to seek certain types of information when making a decision, as values have been found to direct attention. Verplanken and Holland demonstrated that when the universalism value (i.e. pursuing the welfare of all people and for nature) was first primed in an unrelated task, students who strongly endorsed the value sought twice as much information about environmental impacts of TV sets as sought by students who did not endorse such value [7].

However, there are two limitations with prior work. First, Verplanken and Holland studied how individuals' values influence their decision process when there is a clear objective, but online content consumption is not always driven by goals. When individual are not seeking information in order to make a decision, are their topical interests and reading behaviors still influenced by values? Second, and perhaps more importantly, existing research has only shown a link between the universalism value and consumption of environmental information. If values do influence content consumption, then other types of values should also induce interests in other types of information. Without additional research, we lack the practical knowledge of what topics map onto which values.

VALUES AND TOPICAL INTERESTS

As with prior work by Verplanken and Holland, we use the value dimensions in the Theory of Basic Values by Schwartz et al., which were developed through surveys of people across 67 countries and are well studied and tested [5]. Schwartz derived 10 basic values, which map onto 5 higher-level value dimensions [4]. In addition to being well studied and tested, Schwartz's values are also appropriate for this work as they discriminate among individual people instead of national cultures and that they are not limited to work but also include values from different life domains. As represented in Figure 1, the circumflex structure in Schwartz' Value Theory indicates relations of conflict and congruity across values. The closer any two values are to one another, the more similar their underlying motivations. For scope, we focus on three specific value dimensions: universalism, achievement, and hedonism.

First, given the aforementioned prior work [7], we hypothesize a link between universalism and environment

related content. By definition, those who value universalism care about preserving and enhancing the welfare of all people and for nature.

H1. Stronger universalism value predicts stronger interest in content about the environment.

Opposing universalism is achievement. Instead of focusing on others, self-enhancement values focus on individuals' own wellbeing. Those who value self-enhancement emphasize in personal advancement and desire prestige, social status, and demonstrating competence. Recent research showed that these values correlate with the use of work-related words in an online community [1]. Here, we hypothesize a positive link between achievement value and work/career related content.

H2. Stronger achievement value predicts stronger interest in content about the work/career.

Lastly, we hypothesize a positive relationship between hedonism values and leisure content. Hedonism refers to the pursuit of pleasure and sensuous gratification for oneself. It is about seeking pleasure, enjoying life and self-indulgence. Individuals who value hedonism may then strive to maximize pleasure online.

H3. Stronger hedonism values predict stronger interest in content about leisure.

Besides establishing a more comprehensive relationship between values and topical interests, we also aim to answer a practical question: would targeting content based on individual's values actually work? Values do not force behaviors, but merely "induce" [7]. It is possible then that values themselves are not strong influencers when it comes to article reading. Hence, in our study, we test the potential of article targeting in the context of Twitter. Twitter is a microblogging service that is heavily used to share and re-share content online [3].

RQ. Are people more likely to read an article on Twitter that is targeted to their value orientation?

METHODS

The goal of this study is to test whether certain values may predict interest in reading certain types of articles. To explore the feasibility of content targeting, we focused on a concrete reading scenario: article reading on Twitter.

Participants were asked to rate and read three articles, one on each of our three topical foci: Environment, Work, and Leisure. They were then asked to report their general interests in reading articles on each topic category.

Procedure and Measures

This experiment used Twitter as the media backdrop for content targeting. Participants were told that they were participating in a study about reading articles through Twitter. They were first asked to verify whether they had a Twitter account via the Twitter API. Then, they were asked to complete the Portrait Value Questionnaire, which provided a measure for their value orientations [5].

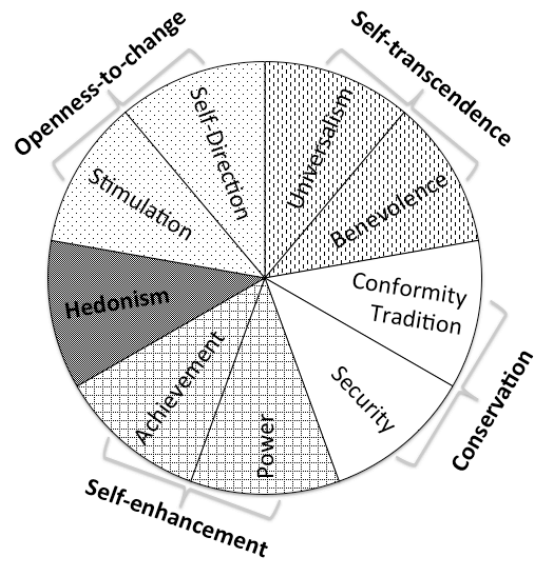


Figure 1. Schwartz' Values

Participants were presented with three articles serially, randomly selected from each of the three topic categories. All nine articles were from Lifehacker, a popular weblog. We chose Lifehacker as our source of articles, because it publishes news feeds on many manually categorized topics (known as tags), and is a popular source of news and tips on Twitter. Our articles were chosen using the "environment" tag for Environment, "work" and "jobs" tags for Work, and "fun" tag for Leisure.



Figure 2. Example Screenshot of Tweet Used in Study (Work)

For our research question on article interest on Twitter, 3 measures were collected. To mimic a typical Twitter reading experience, for each article, participants were given a screenshot of a tweet with the title of the article first (Figure 2). They were then asked to rate their likelihood to click on the link and read the article on a Likert scale ("after reading the tweet, how are you to click on the link to read this article?"). Then, regardless of their ratings, they were directed to a screenshot of the article, and asked to read the article's content. After the article was read, two separate measures were collected: "found the article to be worth reading", and "would re-tweet the article." This experimental design enables us to collect both interest ratings before and after exposure to the article content. Amongst these three measures, the correlation between the two post-reading measures was the strongest at 0.75, with the other pairwise correlations at around 0.55.

At the end of the study, participants were asked to provide basic demographic information and to rate, using Likert scales, their interests in reading articles about the "environment" ($M=3.41$, $SD=1.10$), "work/career"

	Openness-to-Change		Self-Transcendence		Conservation			Self-Enhancement		Hedonism
	Sti.	S.D.	Uni.	Ben.	Con.	Tra.	Sec.	Pow.	Ach	Hed.
Environment	0.03	0.09	0.46***	0.20**	0.03	-0.04	-0.10	-0.29***	-0.25**	-0.18*
Work	-0.04	0.03	-0.08	-0.04	-0.02	-0.07	-0.03	0.20**	0.23***	-0.15*
Leisure	-0.07	-0.11	-0.02	0.09	0.07	-0.08	-0.03	-0.02	0.07	0.13[†]

Table 1. Correlations Between Values and Topical Interests. Note: *p < 0.05, **p < 0.01, *p < 0.001, [†]p = 0.07**

(M=3.24, SD=1.09), and “leisure” (M=3.66, SD=0.95). This latter measure was introduced to test our three hypotheses on general topical interests.

Participants

Participants were recruited from Amazon’s Mechanical Turk. Participation was limited to United States residents to ensure sufficient English language proficiency. In addition, as we are interested in exploring the practical challenges of article targeting on Twitter, the study required participants to be Twitter users who have submitted at least 10 tweets and had created the account more than 4 weeks prior.

202 responses were collected, of which 17 were removed from analysis due to inconsistent responses and no variance in scale ratings. Of the 185 used for analysis, about half were female (93) with the average age of 30 (median 28). Respondents on average posted 1008 tweets (median 377).

RESULTS

To test our three hypotheses on the links between values and topical interests, we examined the correlations between individuals’ value ratings with their self-reported interest in article topics. Results are shown in Table 1. H1 and H2 were both supported. There is a strong correlation between universalism value and interests in reading environment related content (r(183)=0.46, p<0.001), and a moderate correlation between achievement value and work-related content (r(183)=0.26, p<0.001). However, the correlation between hedonism and leisure content was much weaker (H3) with only a weak to negligible relationship between the two (r(183)=0.13, p=0.07). As we will elaborate in the discussion, this weak link between hedonism and leisure articles may be because reading may not be considered a hedonic activity, no matter the topic of the article.

To answer our research question, multiple regression models were built. For each set of articles, we used the hypothesized value as the independent variable (e.g. universalism value for Environment). Article id, modeled as

	Interest when reading given article title in a tweet (β)	Worth reading after reading the article (β)	Likely to retweet after reading the article (β)
Universalism Value for Environment	0.11	0.37***	0.35***
Achievement Value for Work	0.24*	0.15	0.08
Hedonism Value for Leisure	0.16[†]	0.10	-0.05

Table 2. Regression Coefficients Between Values and Interests on Articles of Corresponding Topics.

Note: *p < 0.05, **p < 0.01, ***p < 0.001, [†]p = 0.10

a random effect, is used as a control variable. The results are shown in Table 2.

For Environment, universalism was not a predictor of participants’ interest in reading the article when presented with the tweet (β=.11, p=0.30). However, after reading the article, participants report a significantly higher likelihood to find the article worth reading (β=.37, p<.001) and re-tweeting (β =.35, p<.001). For Work, achievement was shown to be significant predictor of participants’ interest in reading the article when presented with the tweet (β=.24, p=.03), but did not influence their likelihood to find the article worth reading (β=.15, p=.12) or re-tweeting (β=.08, p=.43). Lastly, for Leisure, there was a weak relationship between hedonism and interests in reading leisure articles (β=.16, p=.10), and no relationship with participants’ likelihood to find the article worth reading (β=.01, p=.91) or re-tweeting (β=-.05, p=.60).

DISCUSSION AND LIMITATIONS

This study explores the use of personal values and reading interests. From a theoretical perspective, our findings extend existing research and demonstrate that, in addition to the other influences, values also influence what we choose to read. From a practical perspective, our exploration demonstrates the feasibility of value-based content targeting, but also highlight challenges.

Link Between Values and Topical Interests

Our findings (Table 1) demonstrate that universalism values predict interests in reading about the Environment and achievement values predict interests in reading about Work. This result advances prior work on the value-behavior link by demonstrating that values also influence our reading interests. More importantly, this exploratory work calls for a more comprehensive examination of values and topical interest, beyond the three chosen for this study.

It is important to note that in comparison to the effects of universalism and achievement, the link between hedonism value and Leisure is negligible to weak. We believe that this is because the reading activity in itself may not be considered by many to be a hedonistic activity. This suggests that a more accurate model for the value-reading interest should include a moderating variable. Future work should consider measuring individual’s interests in the activity as a moderating variable, as e.g., value’s influence on topical interests for reading may be different from value’s influence on topical interest for movies.

Feasibility and Challenges of Value-Based Targeting

Our exploration also demonstrates the feasibility of using personal values to target content to an online audience. Testing article targeting in the Twitter context using Lifehacker's categorization of articles, we found that participants' personal values can influence their interest and evaluation of the articles. Specifically, achievement and hedonism values predicted participants' likelihood to read the Work and Leisure articles, respectively, when presented with tweets containing the titles. In addition, universalism value predicted participants' positive evaluation of the Environment articles, post-reading.

However, there were discrepancies in our results. For *Environment* articles, participants' interest were affected by universalism values *only* after they read the article content, while for *Work* and *Leisure* articles, the result is opposite. In that case, personal values affected interests initially, right after reading the tweet, but not their general evaluation of content after reading. One likely explanation is that the articles' title and content may not hold the same appeal-strength. For example, all of the Environment articles were tagged as "environment" on Lifehacker and while these articles have content appealing those with universalism values, the titles (e.g. "easy ways to live greener") seem to often be less direct and less clearly associated with that value. In contrast, our Work articles seem to often have titles explicitly appealing to the motivating values (e.g. "build your career master plan with a mind map"), while their actual content may be mediocre and less effective in advancing one's career. This explanation concurs with Templeton et al. [6], who argued that personal values' effect depends on how well the writing appeals to readers' values.

These results highlight an inherent challenge in targeting content on Twitter. Given that the titles of the articles are often the only text communicated in the tweet, the titles need to be carefully crafted to appeal to the targeted value-orientation. Otherwise, valuable and desirable content may be easily overlooked.

While our findings have demonstrated the feasibility of using value-based targeting, just how useful is it? How could personal values contribute to existing approaches in content targeting and recommendation, such as topic similarity and collaborative filtering [2]?

For topic modeling, because one value can correspond to many topics, personal values may help by associating online posts of seemingly unrelated topics. For a topic modeling algorithm, three online posts may appear unrelated because their topic foci, for example school, work, and career advancement, appear to be different. However, a value-based algorithm may be able to associate these posts due to their common relationship to achievement values. Based on this association, we may be able to predict a person to receive career articles positively despite a lack of data directly linking to career-oriented content, because she has previously reacted positively to achievement-related articles in other topics.

For collaborative filtering, personal values may alleviate the common "cold-start" problem. While effective collaborative filtering requires sufficient rating and/or feedback data for each new problem domain, personal values do not have such a requirement at all. In fact, because values have 10 fixed dimensions and are stable across time and context, we could expect to model a user's values once and use them repeatedly. As such, personal values could serve as a powerful tool for bootstrapping targeting efforts in new unknown domains. As prior work has demonstrated possibility to derive personal values from text [1,6], future work could explore content targeting using not topics but values derived from text.

CONCLUSION

Prior research suggests that personal values can influence the type of information sought when making a choice. This current research builds on prior work by demonstrating that our values also influence our general reading interests. Our findings further demonstrate the feasibility of using values to support content targeting.

ACKNOWLEDGEMENTS

Funding for the first author, Gary Hsieh, was provided by NSF grant #1348542. This research was sponsored by the U.S. DARPA under the SMISC program, Agreement Number W911NF-12-C-0028. The views and conclusions contained in this document are those of the author(s) and should not be interpreted as representing the official policies, either expressed or implied, of the U.S. Defense Advanced Research Projects Agency or the U.S. Government. The U.S. Government is authorized to reproduce and distribute reprints for Government purposes notwithstanding any copyright notation hereon.

REFERENCES

1. Chen, J., Hsieh, G., Mahmud, J., Nichols, J. To appear. Understanding Individuals' Personal Values from Social Media Word Use. *Proc. of CSCW*.
2. Jannach, D., Zanker, M., Felfernig, A., & Friedrich, G. 2010. *Recommender systems: an introduction*. Cambridge University Press.
3. Java, A., Song, X., Finin, T., and Tseng, B. 2007. Why we twitter: understanding microblogging usage and communities. In *Proc. of the WebKDD and SNAKDD Workshop on Web Mining and Social Network Analysis*, 56-65.
4. Schwartz, S. H. 1994. Are There Universal Aspects in the Structure and Contents of Human Values? *Journal of Social Issues*, 50(4), 19-45
5. Schwartz, S. H. 2002. A Proposal for Measuring Value Orientations across Nations. Chapter 7 in the *Questionnaire Development Package of the European Social Survey*.
6. Templeton, T. C., Fleischmann, K. R., & Boyd-Graber, J. 2011. Simulating audiences: Automating analysis of values, attitudes, and sentiment. In *Proc. Of PASSAT/SocialCom*, pp. 734-737
7. Verplanken, B., Holland, R. W. 2002. Motivated decision making: Effects of activation and self-centrality of values on choices and behavior. *Journal of Personality and Social Psychology*, 82(3) 434-447