Your Digital News Reading Habits Reflect Your Personality

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ABSTRACT

The way people read digital news - as distinct from what news they read - has emerged as a significant concern for research in user modelling and personalisation. Intuitively, some people read the news frequently and broadly whilst others read it occasionally and selectively. It is likely that these differences in news reading behaviour arise in part from differences in peoples' personalities. We report a study that surveyed the digital news reading habits and personality traits of 241 people. We find correlations between most news reading characteristics (e.g., how much time over a day a person reads news) and some personality traits (e.g Openness-to-Experience). The correlations provide a better understanding of the different types of news reading user and why they read news in different ways. They indicate the value of extending user model profiles to include personality traits along with domain specific activity factors.

CCS CONCEPTS

• **Human-centered computing** → *User models; User studies*; • **Information systems** → *Recommender systems*;

KEYWORDS

Personality; News Reading Behaviour; Personalisation;

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1 INTRODUCTION

Reading the news is a highly individual activity with marked differences in the way people consume and interact with news content. Prior research using survey methods [5–7] has proposed a Newsreader Typology and identified six factors (the Newsreader factors) that discriminate between the habitual interaction patterns of different news readers. Those factors include how often a person reads the news (Frequency) and the estimated total time spent in a day reading the news (Duration). They also include the way headlines are browsed (Browsing strategy) and specifically whether certain categories of headline are only ever viewed, or whether all categories are always viewed, or whether both modes of browsing can be used on different occasions of news reading. A further factor is the way an article is read (Reading style) and refers to either a detailed exhaustive reading of an article, or the scanning of an article for its gist, or the high speed skimming of an article spotting particular words and phrases. The place where news is read (Location) is also a Newsreader factor whether it is at home, work or in public places. The final Newsreader factor is when news is typically read (Time of day). The study reported in this paper investigates the relationship between these Newsreader factors and users' personality.

Personality is widely recognised as a primary determinant of how an individual interacts with systems and consumes content. Personality traits are domain-independent constructs that are stable over time, can be used across domain for personalisation [2] and reflected distinctly in a person's activities and habits. Standard questionnaire instruments have been developed for assessing primary personality traits and the Big Five Inventory (BFI) questionnaire [19] is amongst the best known and most comprehensively validated. It provides assessments of five primary personality traits: Extroversion; Agreeableness; Conscientiousness; Neuroticism, and; Openness-to-experience. The survey of digital news reading we report makes use of the BFI questionnaire and additionally examines the personality trait of Need-for-cognition (NFC) [1], which is a preference for understanding and rationalising the experiential world. NFC refers to a tendency to undertake challenging cognitive tasks; reading the news can be consider as one. Gajos and Chauncey [10] have found NFC to positively influence the use of adaptive menu systems, a

	Frequency	Duration	Browsing Strategy	Reading Style	Location	Time of day
Extroversion	.500	.331	.990	.206	.513	.284
Agreeableness	.964	.138	.313	.187	.316	.840
Conscientiousness	.638	.659	.463	.403	.621	.934
Neuroticism	.939	.702	.478	.231	.177	.255
Openess-to-experience	**.033***	**.011***	**.036***	.548	**.032***	.621
Need-for-cognition	.386	**.018***	.334	**0.01***	.409	.843

Table 1: Correlations between the Newsreader factors, BFI and NFC. Significant results in boldface adhere to alpha levels of p<0.05.

finding that might apply more generally to personalised user interfaces.

The value of using personality traits in the development of personalised systems has long been argued [13]. Personality-based personalisations have been proven useful in implementing such systems and studied across domain from health [12, 21], to education [3, 17], to movies and music [4, 8, 9] and others, in an attempt to model and explain specific users' behaviours that reflect users' personality. In relation to news, prior studies have been investigated peoples' choice of news topics [11] but rarely in relation to individual patterns of news consumption. Prior studies shed light on the relationships between personality and frequency of social media news consumption [16], yet the relationship between personality traits and news reading habits, such as the way news articles are read and headlines browsed, remains an open question. It is that question which the current study addresses through conducting a survey of digital news reading habits (to elicit the six Newsreader factors) and personality traits (to elicit the six traits discussed above). The aim of this paper is twofold, (a) to examine the relationship of personality (i.e. BFI and NFC) and the six Newsreader factors, and (b) based on the preliminary analysis to enrich our understanding of the extent to which those constructs can be associated with distinct types of news reader.

2 DATA AND METHODS

A questionnaire was developed to survey individuals' digital news reading behaviours and their personality; details about age, gender and education were also collected. The survey contained questions about peoples' news reading habits and preferences that translate to the six Newsreader factors. The questions were developed for the original study which identified the six Newsreader factors [7]. The form of those questions and the response choices are listed below.

(1) *Q:* How often do you read news on your mobile device?
R: [a. Many times b. Once a day c. Occasionally]
(2) *Q:* How much time in a day do you spend reading news on your mobile device?
R: [a. 0-5 minutes b. 5-10 minutes c. 10+ minutes]
(3) *Q:* How do you look for stories of interest?
R: [a. I look through all sections b. I look in particular section c. I utilise both techniques]
(4) *Q:* How do you read a news story?
R: [a. Detailed reading b. Skimming c. Scanning]
(5) *Q:* Where do you most often read news?
R: [a. Home b. Work c. Public Transport]
(6) *Q:* What time of day do you usually read the news?
R: [a. Morning b. Afternoon c.Evening]

The survey also integrated the 50 questions comprising the standard BFI personality traits questionnaire [19]. Additional questions were included to elicit the trait of NFC [1]. The survey also included questions about the demographic factors of age, gender and extent of education. The questionnaire was developed in GoogleDocs (available here[1]) and distributed as an Amazon Mechanical Turk[2] task, a widely used platform to crowdsource user studies [15]. Respondents were paid a nominal sum for anonymous participation. Further, participation was restricted to those with good reputation as workers ($\leq$95% HIT approval rate and $\geq$ 1000 HITs[3] approved) in order to prevent any careless contributions. The survey ran for three separate 24 hour periods after which the data were retrieved and collated in spreadsheets. The results of 241 participants (96 female, Age M=30.89, Age SD=8.38) were recorded. Personality traits were computed from the answers using the standard protocol [19]. A similar process was followed to compute the NFC score [1].

3 ANALYSIS AND RESULTS

Due to the gathered data being not normally distributed, as assessed by the Shapiro-Wilk's test (p<.05), a non-parametric test was selected to examine the relationship between personality and the reading factors. We used the Spearman's rank correlation analysis to investigate potential correlations between the BFI, NFC and the Newsreader factors. All the significant correlations adhere to alpha levels of p<0.05, as depicted in Tables (1,2,3).

Correlations were found between several Newsreader factors and Personality traits (Table 1). People who read the news several times a day (Frequency) are more likely to exhibit the trait of Openness-to experience than those who read the news occasionally. The more time people spend reading the news over a day (Duration), the more likely they are to

[1] https://goo.gl/6AWk5b
[2] Amazon Mechanical Turk: https://www.mturk.com/
[3] HITs (Human Intelligence Tasks) represent the assignments a user has participated in on Amazon Mechanical Turk prior to this study.

	Frequency	Duration	Browsing strategy	Reading style	Location	Time of day
Frequency	-	**.002***	**.006***	.989	.121	.267
Duration	**.002***	-	**.001***	**.004***	.168	.434
Browsing Strategy	**.006***	**.001***	-	.756	.631	.617
Reading Style	.989	**.004***	.756.	-	.050	.567
Location	.121	.168	.631	.050	-	.409
Time of day	.267	.434	.617	.567	.409	-

Table 2: Correlations within the Newsreader factors. Significant results in boldface adhere to alpha levels of p<0.05.

	Frequency	Duration	Browsing strategy	Reading style	Location	Time of day
Age	.403	.084	**.006***	.189	.442	.127
Education	.367	.526	.648	.976	.895	.096
Gender	**.029***	**.044***	.687.	.561	.308	.855

Table 3: Correlations between Age, Education and Gender and Newsreader factors. Significant results in boldface adhere to alpha levels of p<0.05.

exhibit both the traits of Openness-to-experience and NFC. People who sometimes look at all headline categories and sometimes at just particular categories (Browsing strategy) are more likely to exhibit Openness-to-experience than those who always only look at particular categories of headline or always read all headline categories. People who read articles in detail word-for-word (Reading style) are least likely to exhibit NFC whilst those who read by scanning are most likely to exhibit this trait. People who read the news away from home (Location) are more likely to exhibit Openness-to-experience than those who only read the news at home.

Correlations were also found between Newsreader factors and Demographic factors (Table 3). We find that women amongst our respondents are more likely than men to read the news several times a day (Frequency) whilst men are more likely than women to read the news less than once a day. Women are likely to read the news for longer overall in the course of a day (Duration) than men. A correlation in news reading habits was found with education, where the more extensive a person's education, the more likely they are to browse all headline categories than just particular categories. No other correlations with education were found, not even NFC. No correlations were found between newsreader factors and age, so older people amongst our respondents do not read digital news in a different way to younger people. Examining effects between the demographic factors reveals only that respondents who are older tend to have a more extensive education ($r=0.129$, $p<0.05$) but neither age nor education correlate with gender.

Finally, we look at relationships between Newsreader factors (Table 2). It is apparent that the more often people read the news (Frequency), the longer they do it for over the day (Duration) and they will tend to view all categories of headlines each time they read the news (Browsing Strategy). It is also apparent that the longer respondents spend reading the news overall in a day (Duration), the more likely they are to view all categories of headline (Browsing Strategy) and to read news articles by skimming the text for keywords rather than reading in detail or scan reading for meaning (Reading style). People who read the news occasionally, do so for the shortest time overall in a day but read in detail the news articles they choose. These people appear to be highly selective in what they read and when they do it, as reflected in their focussed reading of the material. By contrast, people who read the news frequently in a day are in some sense trying to keep up with all the news as it happens and they will as a consequence be likely to skim read articles. A similar typology of mobile news readers was reported in [19].

Relationships were also found between Demographic factors and Personality traits. With the exception of extrovertism, all the personality traits are increasingly exhibited with age amongst our respondents. A more extensive education correlates with the traits of Agreeableness, Conscientiousness, and Openness-to-experience. Women are also more likely than men to exhibit Neuroticism, a finding reported previously elsewhere [18]. Finally, each personality trait was found to correlate with at least two other personality traits and in particular, neuroticism correlated with all other traits.

4 DISCUSSION

Our study finds that the way a person reads digital news reflects their personality; all but one of the Newsreader factors correlated with either or both of the traits of Openness-to-experience and NFC. Other personality traits might well be found with more extensive testing and a more controlled procedure (face-to-face interviews rather than a crowd-sourced task and ideally a separate verification of respondents' answers). The study found some evidence of differences in news reading habits with gender and education but none with age. Specifically it found that women read the news more

frequently and extensively than men, and people with more education will browse more categories of headline. Demographic factors in news consumption are complex and this survey contained few questions to examine them. Other recent work on demographic factors affecting news consumption [14] finds that older people read the news more often than young people and enjoy doing it more, but young people are nevertheless interested in keeping up with the news, contrary to claims sometimes made [20].

Contrasting types of news reader are revealed by the correspondences between Newsreader Factors and Personality traits. People who read the news frequently tend to also review headlines broadly and skim read articles (e.g., read by keyword spotting). These readers can be characterised as 'Trackers' [7] who try to keep up with the news; their personality will tend towards the traits of Openness-to-experience and NFC; they are more likely to be women than men. By contrast, people who read the news occasionally will look at relatively few categories of headline and when they have chosen a news article to read, they will read it in detail, word-for-word. These readers can be characterised as 'Dippers' [7] who only read the news that interests them and only read it when it suits them. Their personality will tend significantly less towards the traits of Openness-to-experience and NFC.

The intriguing possibility suggested by this analysis is that there may exist other user types within our data. We plan to use clustering methods to more exhaustively and systematically explore the existence of reader types. This will be achieved by ingesting all the Newsreader factors and Personality traits into a clustering method. We will explore whether clustering based on the Newsreader factors alone can be improved by the addition of Personality traits data. Given the correlations we have reported between these two kinds of 'user fact', we will aim to investigate whether the addition of personality traits data can improve the identification of the different news reader types. The promise is that user models can benefit from facts about an individual user's personality, ultimately supporting a more precise categorisation of the user within a particular domain of activity, and therefore a more accurately personalised user interface and interactive experience. For example, an elevated trait of NFC would reinforce the measured longer reading duration for a particular user, and therefore provide stronger evidence for categorising that user as a Tracker rather than a Dipper; it would provide additional evidence for a user interface adaptation where more detailed text was displayed by default.

5 CONCLUSIONS

In this paper we examined the relationship between the BFI personality traits, NFC and Newsreader factors. We found that the ways different people consume digital news reflect difference in their personalities. The results enrich understanding of the extent to which those constructs can be associated with distinct types of news reader. They encourage extending user profiles for news readers by incorporating facts about their personality along with domain specific factors.

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