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# Exploring Hyper-Personal Analytics' Impact on Social Network Usage

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## Abstract

Text-based features extracted from people's digital footprints left on social media make it possible to automatically discern a user's personality, in what is called *hyper-personal analytics*. In this work, we explore the way people feel and think once exposed to these tools. We conducted a pilot study with eight users who used our tool to generate a personality profile for them. Most of the participants found the tool to be accurate, but reported not being concerned with analytics tools and that they would not modify their activity on social media if such tools were being used. A few participants, however, did raise some concerns about privacy.

## Author Keywords

Hyper-Personal Analytics; Social Networks; Privacy.

## ACM Classification Keywords

H.5.m [Information interfaces and presentation (e.g., HCI)]: Miscellaneous; See [<http://acm.org/about/class/1998/>]: for full list of ACM classifiers. This section is required.

## Introduction

Social networking sites are very popular venues to express one's feelings and opinions using written posts and other media. Features extracted from digital footprints left on social media make it possible to automatically construct a

user's personality profile [1]; this is known as *hyper-personal analytics (HPA)*. Such tools may be useful for advertisers or recruiters for jobs, but users may not feel comfortable with these and other possible uses. According to Warshaw et al., users found these generated personality profiles to be “creepily” accurate and expressed complicated feelings once asked to share the results in various scenarios [8]. Despite being uncomfortable about it, users can not simply abandon social media [10]. In this paper, we explore a part of this complex relationship between users, social media, and *HPA* systems. In particular, we study how people feel and think once learning about the capabilities of modern *HPA* methods. We conducted a pilot study with eight users who used our tool to generate a personality profile for them based on their Facebook posts. We present our study procedure and findings in this report.

While many of the prior works [3, 4, 5, 6] are focused on development and accuracy of these analytics, several [2, 1] have demonstrated the applicability of such tools in real life scenarios. Only a few have focused on users' reactions towards such systems. Gou et al. and later Warshaw et al. have explored the concerns and preferences of sharing derived personal traits profiles by users [5, 8] in the context of recommender systems and targeted advertising. Interestingly, despite suggesting the ability to modify generated profiles, users rarely leveraged this feature and felt compelled to share their profiles. In contrast, in our work, we did not focus on sharing preferences in specific contexts such as recommender system or targeted advertisement. Rather we aim to understand the general disposition and concerns elicited based on presenting the existence of *HPA* tools to users.

We conducted a pilot study focusing on how users felt in the presence of an analytic system capable of profiling them

accurately. When qualitatively analyzing the recorded interview, we discovered variety in users' responses. While some were interested in potential uses of *HPA* tools, others were concerned about their privacy and other issues. Regarding accuracy of the tool, five out of eight participants said that the accuracy level was at least ninety percent. Most of the participants mentioned that they would not modify their social network behaviors even in the presence of a personality profiler. Despite expressing privacy related concern in social media, many of the participants did not find any issues with such analytics. We note these findings in this report and provide a discussion.

## **Methodology**

We conducted a pilot study asking participants open-ended questions regarding their social media usage. Then we demonstrated our basic *HPA* system and created a personality profile for each participant, which was then shown to the participant. We conducted the second half of the interview mainly focusing on their feelings about *HPA* tools. Once all the interviews were taken, we qualitatively analyzed the recorded interviews.

### *System design*

We developed a prototype application following the method in [4]. We have used latest 200 Facebook posts [5]. We leveraged words and word categories from the LIWC dictionary [7, 9]. We present one sample result generated by our application in Figure 1.

### *User study*

We recruited participants from the University of Texas at Arlington (UTA) campus area by distributing fliers. We were able to recruit eight participants, only one of whom was female. All participants were aged between 24 and 32. All but one of the participants were graduate students. The

### Your Personality Profile

*You prefer familiar experiences and traditional activities most of the times. You prefer to be conventional. Being organized or diligent is not something you prefer often. You are often reserved and prefer to be quiet. You do not mind expressing irritation to others to some extent. Most of the time you are nervous and worry a lot about things.*

**Figure 1:** User interface of our application for displaying generated personality profile.

interviews were semi-structured in nature and were audio-recorded. At the end of the interview the participants were compensated with a US \$10 Amazon gift card. Our study procedures were approved by the UTA Institutional Review Board (IRB).

## Results

Our primary research question concerns how users' will behave in presence of *HPA* tools. Will users change their behavior? Are these tools acceptable as recommender systems? What are their concerns? We asked these open-ended questions and conducted a semi-structured interview. In this section, we qualitatively analyze the responses we got from these questions.

*Initial reaction to being profiled.* Our participants showed a wide range of reactions, as some were happy about it while others were concerned. All of our participants raised concerns regarding privacy upon viewing their profile.

“Because if these things are commercially available, that means my personal things are going public.”

*Potential usage.* Many of our participants suggested use of *HPA* tools to evaluate personality traits of employees. They also recommended such systems to find better matches in dating sites, perform background checking before selling guns, and criminal investigations to name a few.

### Concerns

We asked participants what may have raised concerns for them if *HPA* applications were commercially available.

*Differently presenting oneself.* The most prominent concern we observed was that people may not always exhibit their true personality on social media, limiting the tool's accuracy.

“People want to project what they want to project on Facebook. I could be a racist, and not a racist on Facebook.”

*Irregular usage.* People may not use social networks regularly, making *HPA* systems less accurate.

“[...] mostly because it depends on activity. [...] you do not like sharing your views, then how can that software judge you? If someone [...] writes a lot, then the software can make an assumption.”

*Change in personality over time.* *HPA* tools may fail to capture changes in personality traits over time.

“[...] for example, last couple of years I have not really posted anything. [...] a lot has changed which I am

not expressing on Facebook, [...] You might get some idea but I do not think that will be *the idea*”

*Slang and other challenges.* Another participant pointed out the difficulty in analyzing informal language.

“Text doesn’t convey a lot of things, no; sarcasm, slang, new term that come everyday, they evolve so quickly, you cannot have AI that learn as quickly.”

*Effectiveness in hiring.* Since most participants mentioned this as a potential use of *HPA* tools, we asked them how effective they think auto-generated recommendations will be.

“[...] people like to do partying in their private life, but in their professional life, they are being professional doing the job correctly.”

Several participants saw no harm in sharing, given that the social network account does not contain sensitive information or negative sides of their traits.

#### *Modifying usage patterns*

When asked whether users will change their existing behavior in social media, we got mixed responses. Interestingly, users with comparatively bad results were more willing to change. However, a larger study is required to check whether generated result influences user reaction.

## **Discussion**

In this section we discuss our findings and then address some possible avenues for future work.

*General Disposition.* Though some participants show

some level of discomfort, none of them expressed a high level of aversion towards *HPA* systems. As long as permission is taken explicitly and not shared with unwanted authorities, the majority of our participants were willing to have such an application profile them.

*Computing backgrounds.* We observed that people with a background in computing expressed more concern than others. Our sample size is way too small to generalize this observation, but we suggest further study on this and careful selection of the participants to account for background.

*Changes over time.* Evaluating a person based on what they wrote years ago is not likely to reflect that individual properly. Along with considering posts until the system gets a certain number of words, at what time the posts or comments were created should also be taken into consideration.

“I think those are because some of the social issues that I have shared. [...] they pick the words, right? I will be more cautious about it”

*Language.* Most people prefer using their native language for expressing thoughts and feelings. *HPA* applications should add support for other languages to be accurate.

*Future Work.* A larger study with more diverse population will yield more accurate results. Beyond that, however, to really understand the degree to which informed social network users modify their usage of such sites in the presence of *HPA* systems, further study is required. Analysis of the recorded data can then give insight on any changes of their social network usage.

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