# The Effect of Personality Traits on File Retrieval

Ofer Bergman[1], Tamar Israeli[1], Steve Whittaker[2], Nimrod Yanai[1], and Yair Amichai-Hamburger[3]

[1] Bar-Ilan University, Israel

[2] University of California at Santa Cruz. USA

[3] Interdisciplinary Center Herzliya, Israel
oferbergman@gmail.com

**Abstract.** File retrieval is important for Personal Information Management (PIM). If retrieval fails, people cannot re-use files that they created or other people shared with them. In this paper, we examined the effect of personality traits on retrieval success and efficiency in two studies. Study 1 (n = 60) examined the effect of the Big Five personality traits. Study 2 (n = 300) evaluated the effect of other personality traits that we hypothesized would improve retrieval: *need for control*, *orderliness*, *memory*, *computer literacy*, *minimalism*, *stress resistance*, *sociability* and *empathy*. None of the tests we conducted were significant, meaning that even if future effects are identified, they will most probably be weak. In contrast, significant effects on retrieval success and efficiency were previously found for factors such as: sharing method, file collection size, number of collaborators sharing the file, file versions, recency since last retrieval, folder depth and workload. Nevertheless, the null-results we report here are important because the failure to publish non-significant results can have a negative influence on research. Otherwise these effects may be repeatedly studied until significant results emerge and are published, possibly because of a type I error.

**Keywords:** Personal Information Management, File Retrieval, Personality Traits.

## 1 Introduction

Personal Information Management (PIM) is an activity in which people store information items (e.g. files and emails) in order to retrieve them later. Retrieval is the main reason people manage their personal information and it is essential for retrieval to be successful and efficient as information cannot be used unless it can be re-accessed [1].

There is a current trend in information science to evaluate the effect of personality traits on information behavior [2-8]. By and large, these studies indicate that people's different personalities are reflected in the manner in which they *organize* and retrieve information. The effect of personality traits on PIM organization was examined in [9], indicating that *neuroticism* and *conscientiousness* affect how people organize their personal data. However, to the best of our knowledge, prior studies did not systematically

examine the effect of personality traits on PIM *retrieval*. We tested the effect of personality traits on retrieval type, success and efficiency in two studies which are both parts of larger projects. In study 1 (n = 60), we tested the effect of the Big Five personality traits on shared files retrievals using personal computers and mobile phones. In study 2, we tested other personality traits that we hypothesized would have a positive effect on retrieval (*need for control*, *orderliness*, *memory*, *computer literacy*, *minimalism*, *stress resistance*, *sociability* and *empathy*) on shared files retrieval (n = 300).

## 2 Background

There are profound differences in the way people seek information. Some people may plan and structure their searches, while others gather information in a more flexible and spontaneous fashion. The reasons behind different information approaches lie in the context, but may also be related to personality traits.

Most studies on the influence of personality traits on information seeking behavior used the Big Five personality traits. Heinström [2], discovered that the information-seeking behavior of students was either exploratory or precise. The exploratory search style was characterized by far-reaching journeys in the information sea. This seeking style seemed particularly characteristic of outgoing, competitive, and *open* persons - traits that reflect enthusiasm. In contrast, precise searching that focused specifically on high-quality information seemed typical for *conscientious* students with a deep, strategic study approach [3]. These findings were similar to those of Palmer [4] who tested the information-seeking behavior of scientists. Participants from a group identified as innovators, usually sought information widely, enthusiastically and used many different sources of information, while participants from the other group identified as adaptors were more controlled, methodical and systematic in their information seeking.

Correlations of specific traits to information behavior were found in other studies as well. Individuals with high levels of *conscientiousness* performed fastest in most information-seeking tasks [5], nursing students with a broad, exploratory approach to searching, scored high on *openness* whilst strategic learners scored highest for *conscientiousness* and *neuroticism* [6]. A direct relationship was found between extroversion and covert relational information seeking among organizational newcomers [7]. When studying information seeking behavior on smartphones, Zhitomirsky-Geffet & Blau [8] found that Psychological and cognitive factors influence the type of information people seek. Users with more *neurotic* personalities sought more social information than users with more *conscientious* personalities.

More specifically in PIM, Massey et al., found that *neuroticism* and c*onscientiousness* affect how people organize their personal data [9], with conscientious people tending to create more desktop folders and neurotics being less likely to delete desktop files. However, to the best of our knowledge, the effect of personality traits on PIM file retrieval has never been studied.

# 3 Research Questions

1. *Do the Big Five personality traits affect retrieval success and efficiency?*

2. *Do the following personality traits affect retrieval success and efficiency: need for control, orderliness, memory, computer literacy, minimalism, stress resistance, sociability and empathy?*

We hypothesized that all the independent variable in RQ2 have a positive effect on retrieval success and efficiency for the following reasons: People with more *need for control* and that are more *orderly* are likely to better organize their files, people with better *memory* are more likely to remember where they located their files when navigating to them and are more likely to remember relevant search words when searching for them. People with better *computer literacy* can use it when organizing and retrieving their files. People who are *minimalists* have fewer files than hoarders and therefore are more likely to find them. Assuming that workload hinders retrieval, *stress resistance* should help overcome this negative influence. And because shared files are often organized by collaborators in shared repositories, *sociability* and *empathy* might help participants infer where their collaborators stored the file.

# 4 Research Method

Following [10-13] we used the Elicited Personal Information Retrieval (EPIR) technique. Upon the tester's request, participants retrieved files. Thus, participants were free to choose their own sharing, storage and retrieval methods when retrieving files from their own computers. Having users retrieve files from their own computers is critical given the key role of subjective organization in PIM [1,14]. This increases the ecological validity of our study compared with more lab-based techniques.

## 4.1 Procedure

In preparation for the retrieval tasks, we selected list of target files. Following the EPIR method, in each retrieval task, the tester asked the participant to retrieve a single file by specifying its name. Participants were instructed to retrieve the information item and click on it once, but not open it (to protect their privacy). Each retrieval attempt continued until the information item was found successfully or the participants said they could not find it with no time limit. Retrievals were recorded and analyzed. After the retrieval tasks, we conducted a survey that included a personality traits test. The full proceeding of Study 1 can be found in [13] and of Study 2 in [19].

## 4.2 Participants

Table 1 summarizes the main information regarding the participants in both studies.

**Table 1.** Information regarding participants.

| | Study 1 | Study 2 |
|---|---|---|
| Number of participants | 60 | 300 |
| Excluded for technical reasons | 3 | 11 |
| Gender | 61% females | 75% females |
| Age | $M = 25.6$, $SD = 3.82$ | $M = 36.99$, $SD = 12.7$ |
| Occupation of most participants | students | corporate workers |
| Computer literacy (Likert 1-5) | $M = 3.9$, $SD = 0.83$ | $M = 3.83$, $SD = 0.87$ |

### 4.3 Dependent Variables

Our dependent variables are defined in Table 2.

**Table 2.** Dependent variables definitions.

| Variable | Definition |
|---|---|
| *Percent of failed retrievals* | The percentage of all retrievals for which the participant did not find the target file. |
| *Retrieval time* | The time (in seconds) that elapsed from when the EPIR software presented the target file until the moment participants either clicked on the correct file or announced that they could not find it. |
| *Percent of successful retrievals with misstep/s* | The percentage of retrievals in which the participant made at least one mistake during the retrieval but eventually found the target file. |

### 4.4 Research Limitations

We recruited our participants using nonrandom selection, and therefore they may not represent the entire population. Moreover, the majority of our participants in both studies were women.

## 5 Results

All of our results were tested in two ways: (a) between each pair of independent and dependent variables using Pearson correlations and (b) using three simultaneous linear regressions for all independent variables relevant to the research question, one for each dependent variable.

*RQ1. Do the Big Five personality traits affect retrieval type, success and efficiency?*

We tested the effect of each of the Big Five personality traits on each of our dependent variables (failure percentage, retrieval time and percentage of successful retrieval with misstep/s). None of the results were significant.

*RQ2. Do the following personality traits affect retrieval success and efficiency: need for control, orderliness, memory, computer literacy, minimalism, stress resistance, sociability and empathy?*

Initially, we used a questionnaire with statements regarding each personality trait (e.g. "I have a good memory"), and the participants were asked to indicate to what extent they agree with the statement using a 1-5 Likert scale. To our surprise, none of the results were significant. We thought that this was because the variability in the personality traits score was small, and that this was a result of the tendency to agree with the question asked, as well as the relatively small scale.

In order to increase the variance in our independent variables, we sent another questionnaire to the participants. This time we used a two poles 1-10 Likert scale (see Table 3). We also included two additional questions regarding *file orderliness*, which is the relevant behavioral manifestation of *orderliness*, and *memory for file locations*, which is the concrete behavioral manifestation of *memory*. We sent this second questionnaire to all our participants and received results from 182 of them. Table 3 displays the bipolar scale used in our study as well as descriptive statistical results.

**Table 3.** Results of the personality traits questionnaire.

| Trait | Spectrum | M | SD |
|---|---|---|---|
| Need for control | 1 don't need to be in control… 10 need to be in control | 7.53 | 1.84 |
| Orderliness | 1 messy... 10 orderly | 7.74 | 1.99 |
| File orderliness | 1 don't pay attention when managing my files… 10 pay attention when managing my files | 7.31 | 2.33 |
| Memory | 1 forgetful… 10 good memory | 7.24 | 2.07 |
| Memory for file locations | 1 don't remember where my files are… 10 remember where my files are | 7.79 | 1.80 |
| Computer literacy | 1 don't get along with computers… 10 skilled computer user | 7.60 | 1.82 |
| Minimalism | 1 hoarder… 10 discarding anything redundant | 5.40 | 2.48 |
| Stress resistance | 1 vulnerable to stress… 10 stress resistant | 7.40 | 1.95 |
| Sociability | 1 prefer solitude… 10 like company | 7.21 | 2.14 |
| Empathy | 1 don't understand how others think… 10 understand how other people think | 7.71 | 1.82 |

The results of the second questionnaire displayed in Table 3 had slightly more variability than those of our first questionnaire and reliability between tests was high. However, once again, none of the results regarding personality traits were found to be significant. Only the behavioral manifestations of orderliness and memory for files were found to have an effect on retrieval:

### 5.1 File orderliness

We measured the specific manifestation of *orderliness* for file management on a Likert scale between 1 ('I don't pay attention when managing my files on my computer') and 10 ('I pay attention when managing my files on my computer'). As expected, there was a negative correlation between the degree to which participants paid attention to management of their files and retrieval time: $r(181)=-0.22$, $p<0.01$. Interestingly, there was no significant correlation between *orderliness* as a personality trait (1='messy', 10='orderly') and any of our dependent variables. One possible explanation is the relatively low correlation between *orderliness* as a personality trait and its specific manifestation for file organization $r(181)=0.50$, $p<0.001$.

### 5.2 Memory for files

We measured the specific manifestation of *memory* for file retrieval on a Likert scale between 1 ('I don't remember where my files are') and 10 ('I remember where my files are'). As expected, we found a negative correlation between memory for file locations and retrieval time: $r(182)=-0.29$, $p<0.001$. Again, we found no significant correlation between the personality trait (1='forgetful', 10= 'have a good memory') and any of the dependent variables. And again, a possible explanation is the relatively low correlation between *memory* as a general trait and *memory for file locations* as its manifestation: $r(182)=0.335$, $p<0.001$.

## 6 Discussion

This paper describes two studies in which we tested the effect of personality traits on retrieval success and efficiency. In study 1 ($n = 60$) we tested the effect of the Big Five personality traits and in study 2 ($n = 300$) we tested the effect of personality traits we hypothesized would improve retrieval (*need for control, orderliness, memory, computer literacy, minimalism, stress resistance, sociability* and *empathy*). None of our results were significant.

Although it is reasonable to hypothesize that personality traits affect retrieval success and efficiency, our study did not indicate this. Even *orderliness* tendency and *memory* ability did not affect retrieval; only their concrete manifestations for files (*file orderliness* and *memory for file locations*) trivially do. A possible clue to explaining the non-effects of general traits is the relatively low correlation between these personality traits and their concrete manifestations with regard to files. For example, people can have a well-ordered file directory but a messy office, and can have a bad memory as to where they had placed their files but a good memory for people's names and historical events. Psychological research indicates that people's behaviors can be inconsistent across different situations [20].

In conclusion, our results do not prove that personality traits have no effect on file retrieval. However, they do suggest that at least for the variables tested, the effect is weak at best. Compared to this, other studies found a strong effect for retrieval method, with files shared using group repositories having almost twice the failure rate as files shared using email attachments and saved in personal repositories [11]. Other factors

that have significant effects on retrieval success and efficiency include: the size of the file collection, the number of collaborators sharing the file, whether the file has different versions, folder depth, recency since last retrieval, folder depth and workload [19]. Nevertheless, the non-results presented in this paper are valuable since it is well known that not publishing non-significant results can have a negative influence on research, as these effects may be studied again and again until significant results emerge and are published, possibly because of a type I error [21].

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