



Why Followee Recommendation?

- Online social networks have an important place in the life of their millions of users.
- In **online contexts** where users do not know each other personally, **finding new friends** might be a **challenging task**.

The accurate suggestion of potentially interesting friends or followees arises as a crucial issue in recommendation systems, which is accentuated by the overload of available information

However...

Most followee selection approaches have been only based on **common** and **independent factors**!

They disregard how users' **psychological characteristics** or **personality** can affect the selection of followees.

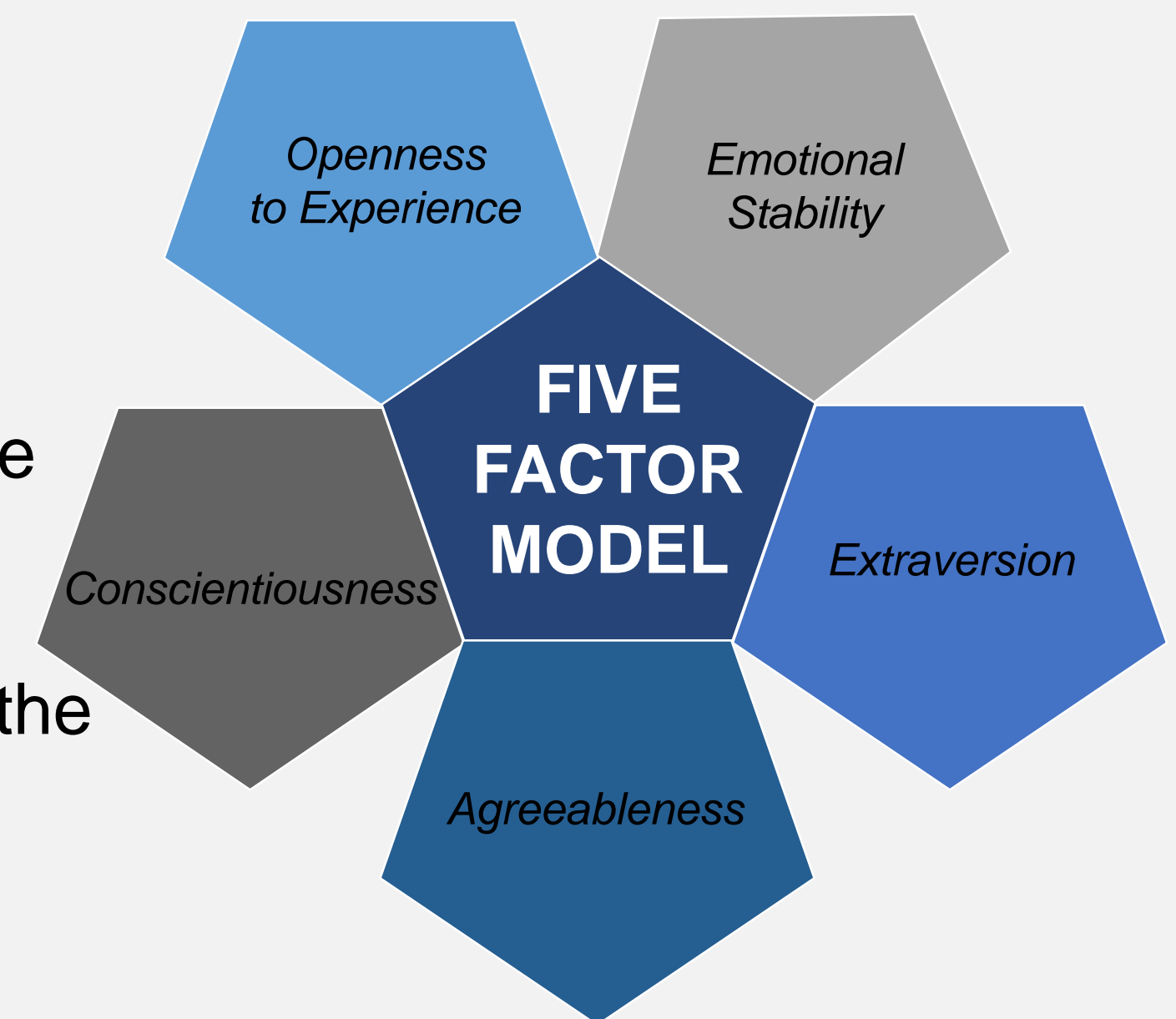
We propose!

Measuring the impact of **personality** in the accurate prediction of followees beyond **common recommendation factors**

Exploring Personality and Social Relationships



- Psychology defines personality as a set of **emotional, attitudinal, interpersonal processes** and **behavioural response patterns** specific to each person.
- Personality is one of the **most important factors influencing behaviour**, as it moderates how people **behave, interact** and **react** to other individuals.
- An overall similarity measure (e.g. Cosine Similarity over all dimensions) is not enough for assessing the real similarity between individuals.
- Individuals with **similar personalities** have **similar interests**.



- **Individual similarities** across each dimension are **more important** than the similarity computed considering **all the dimensions together**.

Combining Factors for Followee Recommendation

- The **common factors** for followee recommendation and the **personality** scores are linearly combined for assessing the similarity between a user (u) and each potential followee (pf).
- Several weight combinations for each factor are analysed to determine their optimal weights.

$$OverallSimilarity(u, pf) = \alpha * CommonFactorSimilarity(u, pf) + (1 - \alpha) * PersonalitySimilarity(u, pf)$$

Common Factor Similarity

Topology

Compute the similarity between users based on their neighbourhoods or ensembles of paths.

Common Neighbours

$$\frac{|\Gamma(x) \cap \Gamma(y)|}{|\Gamma(x) \cup \Gamma(y)|}$$

Sørensen

$$\frac{2 * |\Gamma(x) \cap \Gamma(y)|}{k_x + k_y}$$

Content

Users' interests can be characterised in terms of:

The information they read and consider interesting.
(**reading profile**)

The information they create and publish.
(**publishing profile**)

A content-based followee recommendation should match the **reading profile** of a user with the **publishing profile** of their potential followees.

Personality Similarity

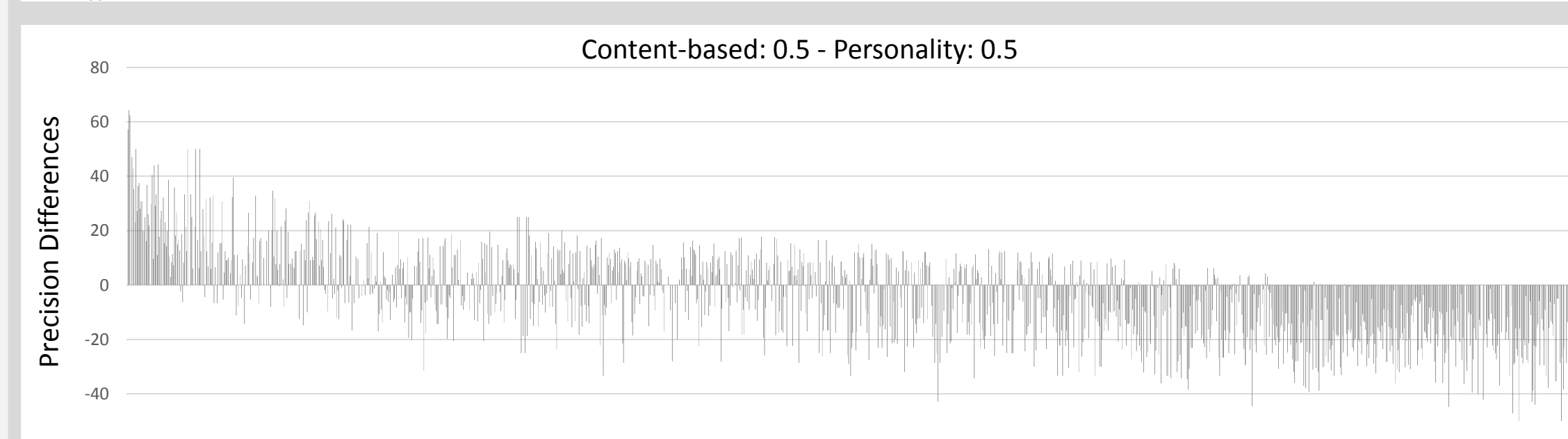
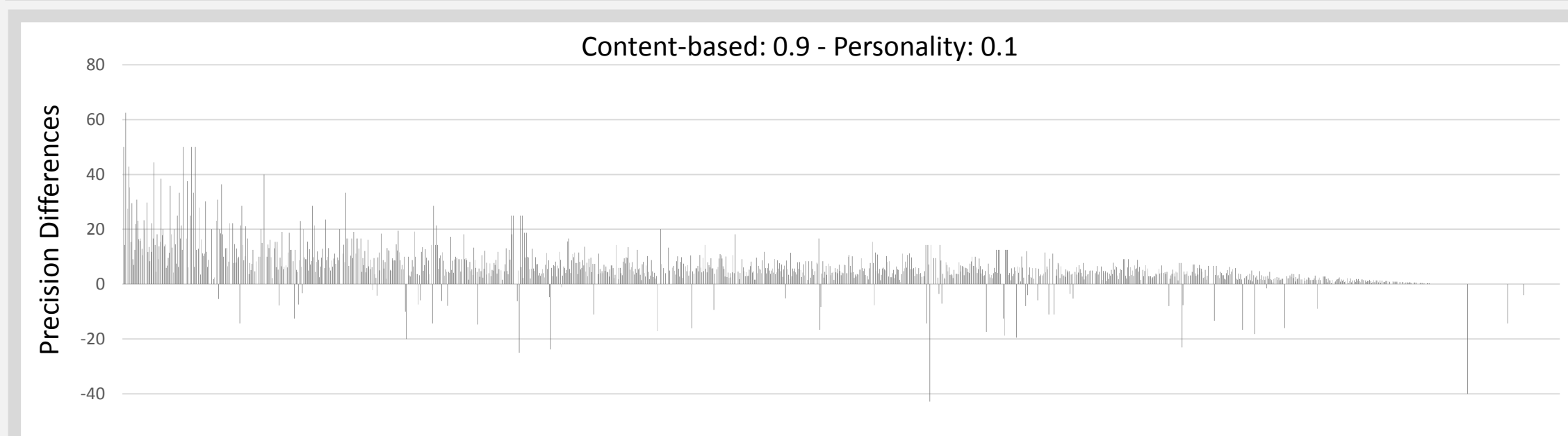
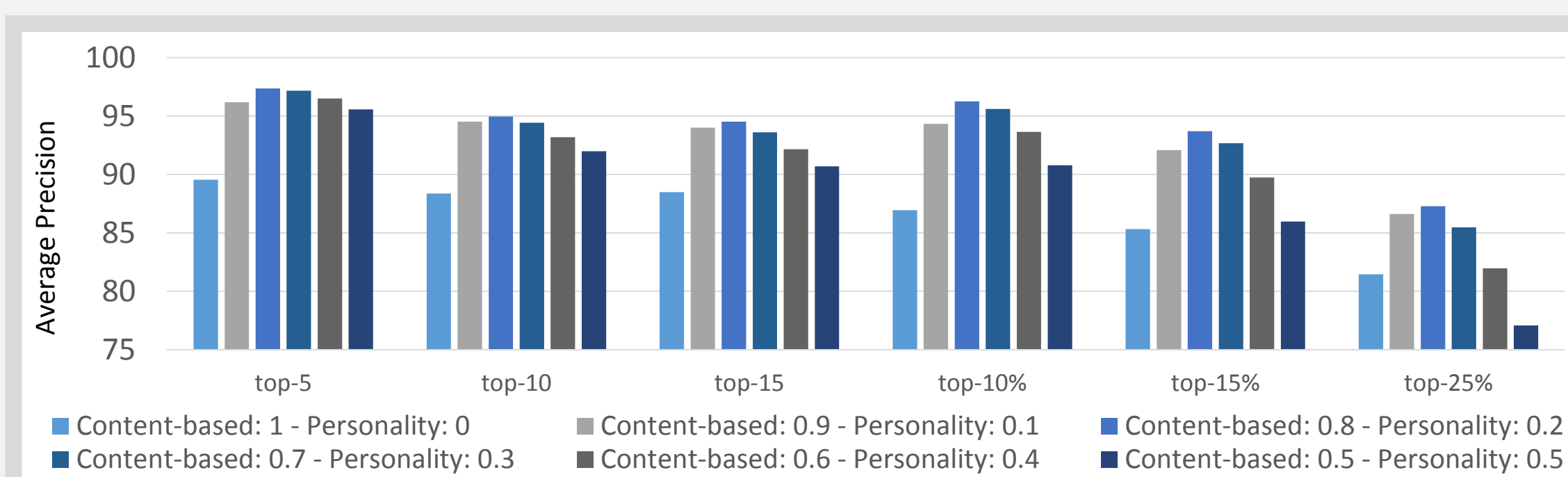
The scores of each personality dimension must be summarised into a **unique** personality matching score.

- The score in each individual dimension of the potential followees in relation to the statistical distribution of scores of the actual user followees is analysed.
- The overall *PersonalitySimilarity* is computed as the average of the individual dimensions *MatchingScore*.

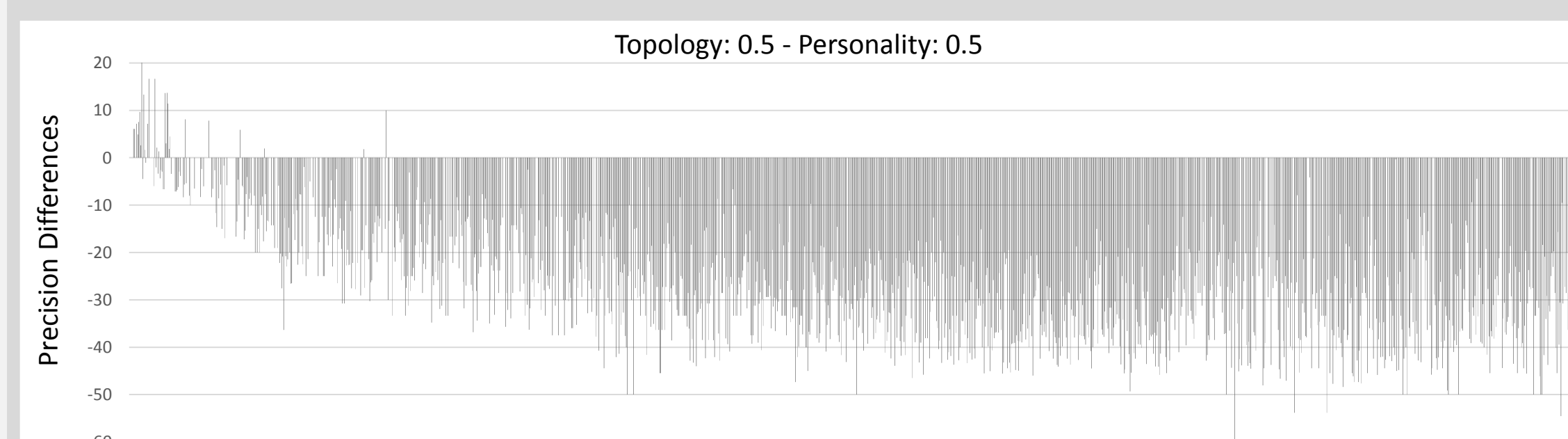
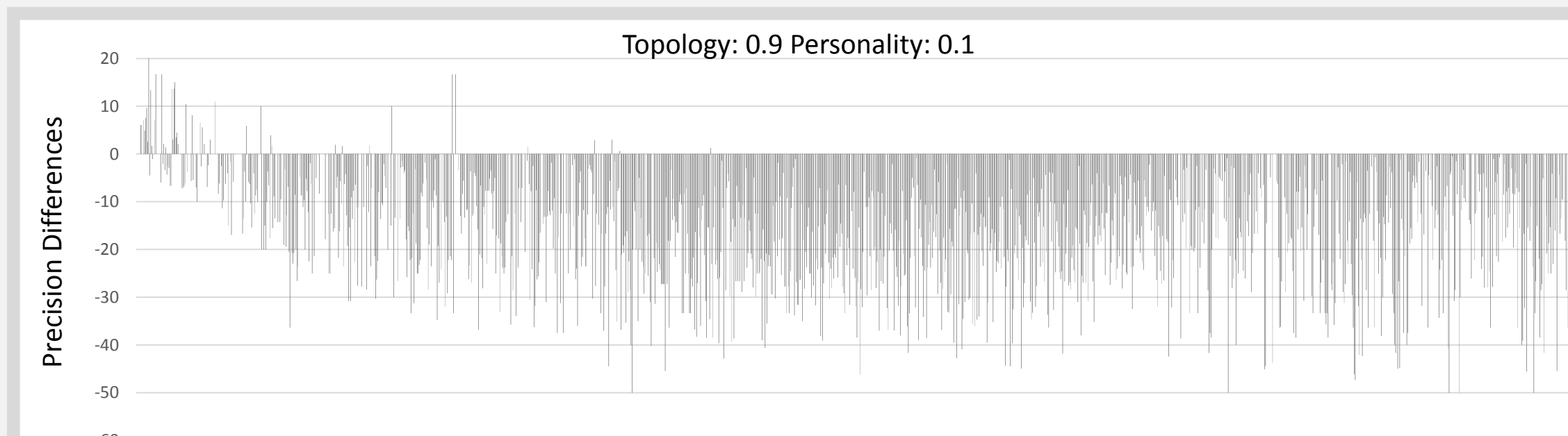
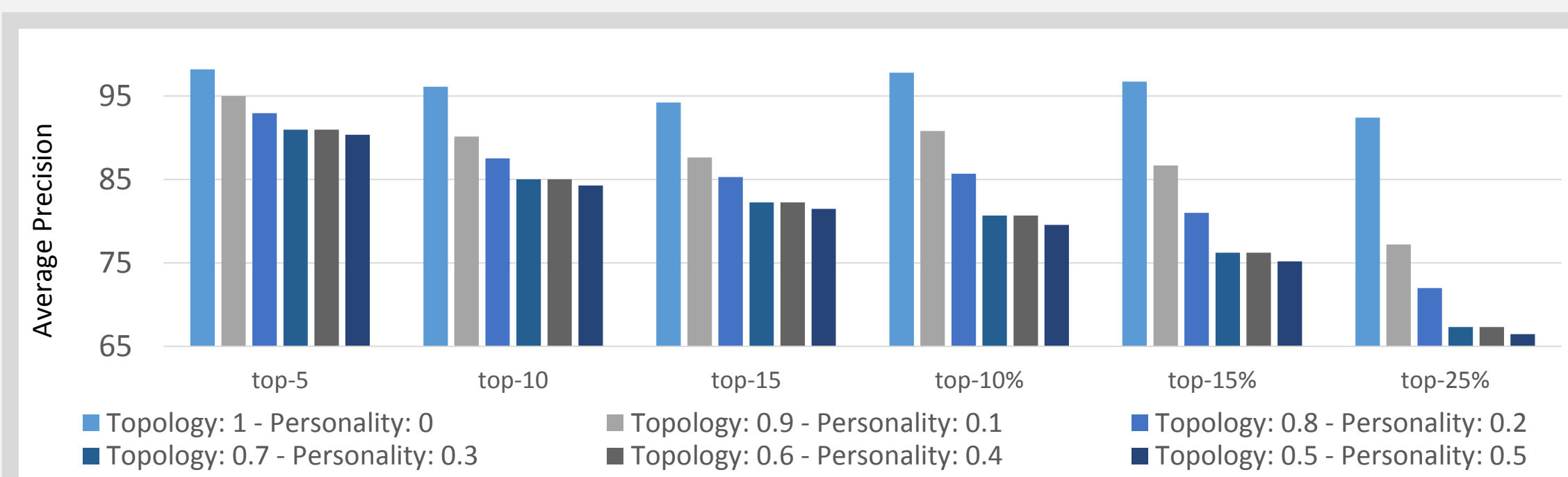
Matching Score ($u, pf, dimension$) =

$$\begin{cases} 1 & \text{score}(pf, dimension) \in \text{interquartile.range}(u, dimension) \\ 0 & \text{every other case} \end{cases}$$

Personality and Content-based



Personality and Topology



Conclusions

Personality has a **significant and non-incidental effect** on precision results.

Personality **should be considered as a distinctive factor** for followee selection in content-based social networks, such as *Twitter*.

The **combination of common recommendation factors** and **personality** improves the search of potential followees.

There is a **limit** to the importance that should be assigned to personality.