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# Your Picture Says It All: A Study of Personality by Images

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**Abstract:** *Multimedia enabled devices and an abundant use of internet has made interaction with images through social media a widespread. By posting images daily, the users of social media tend to present their daily activities, temptation, and preferences. In this study, we show how the profile picture of a social media user relates to his personality, as measured by the standard Big-Five model. A profile picture refers to self-representations of the user which reflects their personality on the social media platforms.*

**Keywords:** *Profile pictures, social media, Big-five model*

## I. INTRODUCTION

Recent years have shown that people are massively using social media to keep track of their daily activities and preferences. Social media has become a tool for communication and interaction between the users. This increase of interaction has enabled many researchers to study about user's online personality. Recent online social networks such as Instagram, Facebook, and Twitter have become popular where people tend to share their daily activities. In psychology, the personality of an online user is based on how he presents himself before his audience. Many researchers have shown that there is an interaction between the social media and the personality of the online user [1]. Self-presentation is mainly done by posting status, images or videos. The most common focused thing while predicting one's online personality through face images is the facial expressions. Celli, while focusing on this found that personality could be extracted from Facebook profile picture content [2]. Various information shared by the social media user can be used to predict his personality. Information such as the profile images posted can be viewed to predict the personality. When posting self-portrait or the profile picture users view how they are looking at the picture and try to apply filters of their choice to the picture. Motivated by this work, this paper tries to find if the profile image posted by the online user on social media can be used to predict their personality. Psychology says personality is the set of the emotional and behavioral responses of an individual. The personality of the individual is mainly based on the standard Big-Five model of personality trait. In this model the human personality is being divided into five categories namely openness, conscientiousness, extraversion, agreeableness and neuroticism [3].

### A. Personality

The word personality has come from the Latin word 'persona' which means mask, that the actors wore to change their appearance [4]. Personality is nothing but patterns of thoughts, behaviors and feelings that makes him unique. Many research has been going through to find the personality of the online user. Personality of a user can vary with respect to time and environment. Therefore, personality of the user must be categorized. This analysis is done using the Big-Five model of personality trait. Here a user is assigned a trait according to his behavior, thoughts and feelings. The Big-Five model is divided into five traits namely, the openness (imaginative, curious, simple), the conscientiousness (organized, frivolous, responsible), the extraversion (talkative, reserved, enthusiastic), the agreeableness (kind, fault-finding, appreciative) and the neuroticism (calm, worried, nervous) [3].

## II. RELATED WORK

In psychology, the detection of personality from human appearance is an interesting topic of research. Many research in psychology has shown that facial expressions are the basis for personality detection in humans [5]. Psychologists have given possibility that computer vision algorithms and neural networks could be used to predict personality automatically [4]. With many recent advancements in technology, an important research topic in the field of computer science is the detection of personality. The personality of user can be directly observed by social media usage like the text, video, audio and social data. In this study we use profile pictures to predict personality. Although online users can use other images but using profile pictures convey more implications to others. The face of the person is the main subject for predicting the personality from images. This include face detection, face recognition, emotion recognition, sentiment analysis from the images. Many work has been done for predicting

personality previously. Celli found that personality can be found from profile pictures and interaction styles [2]. They used 100 Facebook users. Bag-of-visual-words features was used with SIFT features along with machine learning algorithms to classify the users with high or low personality traits. Around 65% of accuracy was found in their research.

### III. BIG-FIVE MODEL

In the past few years many researchers have adopted the basic standard of personality structure, that is, the “Big-Five Model(BFM)” of personality. This model is a scrutinized and effective standard used for personality prediction [4]. This model has the structure of having five components that describes the personality structure namely “OCEAN”: Openness, Conscientiousness, extraversion, Agreeableness, and Neuroticism. Many of additional experiments on the model showed that the validity of model did not change by various languages, tests and methods of analysis [3]. The model used in this study explores the posted profile picture features.

#### A. Openness

Openness type users are likely to have profile pictures that are not faces. The images are high in contrast, saturation, sharpness and less blur. Photos are not related to the color and emotions and thus are less colorful. Facial presentations show that users of openness show reading glasses and not the sunglasses [6]. If the picture contains a face in it then it may be larger in size. Psychological research shows that users who wear reading glasses are more intelligent [6]. They prefer photos of sports and games. Facial emotions are related to the use of color effect [7]. Photos of openness users are high in emotions like anger and low in smiling, attention and joy.

#### B. Conscientiousness

Conscientiousness trait is mainly related to self-disciplined, orderliness. This shows pictures with only one face in it. The fact here is that users of conscientiousness trait posts pictures of themselves. This trait users choose pictures which are more colorful, bright, natural and not grayscale. Facial representation shows users with not wearing glasses and has smaller face ratio [6]. Emotions are high in smiling, valence on one hand and anger, sadness on other. Thus, conscientiousness users express most of the emotions from the rest of the traits. Therefore, we cannot accurately say anything about the conscientiousness user’s behavior but the profile picture shows that the user is expected to be happy and smiling.

#### C. Extraversion

Extraversion mainly involves interaction with the outside world. Users of this trait posts more colorful, contrasting and less blurry images. Images involve more people. They have a small face ratio, caused by many people present in the image or showing the environment. Extrovert users do not display reading glasses and have the same emotions as the conscientiousness user.

#### D. Agreeableness

Agreeableness trait users believe in cooperation and social harmony. Users have faces in the profile pictures. They prefer pictures that are colorful, low in sharpness, bright and blurry. Their photos are mostly having pictures of pets, food and travels. Facial emotions are likely to positive mood such as joy and smile.

#### E. Neuroticism

Neuroticism trait mainly shows negative emotions. It is mainly opposite of extraversion and agreeableness trait. Pictures shows uncolorful, simple, negative color emotions. Neurotic users do not post pictures with faces. If face is present then it is mainly with reading glasses and is significantly larger. Facial expressions are higher in negative emotions like sadness and anger. Lack of emotion expressions in profile picture is thus the characteristics of the neuroticism trait. Thus, this shows that traits can be highlighted with two well aligned clusters namely openness and neuroticism in one and conscientiousness, extraversion, and agreeableness in other [3].

### IV. PICTURE FEATURES

#### A. Aesthetics

Beauty and quality is an important factor of an image style. If the quality of the photo is good then it is memorable, pleasing and does not show the mood of the subject. Quality of photo is related to beauty, attractiveness and inventiveness. The image aspects mainly depend on the brightness, saturation and contrast. The more the brightness in image evokes creativity and pleasing feeling

while darkness in image evokes anger, sadness and aggression. For face pictures, these aspects focus on the mouth, nose, eyes and the face oval.

#### B. Colors

Colors relate to people's conceptual ideas like emotion and the mood. Studies have shown that colors from images relate to the psychological traits [7]. Red shows excitement, green shows freshness, clarity while blue shows security, trust and comfort [7].

#### C. Emotions

Facial expressions give user personality and the intent of image. A simple change in the expression of face can be judged by the people because some brain areas are used in processing of emotional expressions of faces [8]. There are mainly six types of emotions: anger, disgust, happy, neutral, sad, surprise. Profile pictures with smiling face is said to be related to attractiveness, creativity and joy.

#### D. Self-Presentation

This includes the way in which user presents himself before his audience through pictures. Facial features include face ratio, type of glasses worn by face that is, whether sunglasses or reading glasses, whether beard is present or not [6].

### V. CONCLUSION

This study shows that the profile photos on social media and personality traits are related. To this, we used facial features, facial expressions, colors of image. Each personality trait had a type of profile picture posting on social media. Users with extraversion, conscientiousness and agreeableness tend to post more photos and when posted it contains one or more faces. Users with openness and neuroticism tend to post pictures only with one face and with a positive mood. Extraversion and agreeableness users tend to post colorful images while conscientiousness users post what exactly is needed in picture that is, the face with positive emotion. Thus, this study represents a method for analyzing personality through social media profile picture choice.

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