

## Users' Personality Traits Profiling based on their WhatsApp Display Pictures

**Anjana AP, Kruti Shah and Alwin Thomas**

MBA students,  
Waljat College of Applied Sciences, Muscat,  
Sultanate of Oman.

**Mithun Shrivastava**

Assistant Professor, Department of Management,  
Waljat College of Applied Sciences, Muscat,  
Sultanate of Oman.

### Abstract

Nowadays social media plays a vital role in our lives. Social media dominates our day-to-day interactions, and has become a platform where individuals portray themselves to the society by showing their personal information, thereby creating a perception about themselves and their lives. Among the various social media platforms, WhatsApp is one of the most frequently used platform by youngsters. Moreover, youngsters tend to change their display pictures almost as often on WhatsApp if not more than on any other platform. An individual's portrayal through the use of display pictures has become an important trend across almost all social media platforms. Such conscious portrayals by individuals act as proxy indicators for identifying an individual's profile, especially in context of one's personality. This research paper focuses on personality traits profiling of people based on their display pictures on WhatsApp. The aim of this research is to explore and examine the patterns, possibly indicative of relationships between personality of individuals and the changes in their display pictures over time. Moreover, an attempt has been made to investigate synchronization in the display pictures changing behaviour between individuals possessing similar personality traits. In this study, the Big Five personality traits have been used to categorize individuals. To investigate this, an adapted version of 50-item international personality item pool (IPIP) scale was administered online to a purposive sample of 55 participants. The results emerging from this study are indicative of a relationship between the personality traits of individuals and patterns related to changes in their display pictures over time. This study is expected to provide significant insights for future research on understanding personalities of individuals based on analysis of select social media visual data consciously uploaded and changed by them from time to time.

**Keywords:** Social Media, Display Pictures, WhatsApp, Big Five Personality Traits, mini-IPIP

## Introduction

The emergence of technology assisted communication like mobile technologies has led to a substantial rise in popularity of social media. Social media is widely used by youth these days to share photos, text, videos, and other media through which they directly/ indirectly express their personality besides offering a glimpse into their day-to-day lives. This platform provides social media users a space to project an online identity that might be quite different from their real identity. One such indicator used by them is their display pictures uploaded on the various social networking sites. The concept of display picture was introduced by the most famous social media platform Facebook in the year 2004, and by 2007 people started using this feature extensively. Display picture is an important part of the user's online profile, and is visible across all online activities. Display pictures can be of different types; they can be an individual's pictures of herself/ himself, various quotes by famous people, or even pictures that are related to an individual's personal interests. Due to frequent usage of social media, users generally update their display pictures on a regular basis.

WhatsApp is a social media app which facilitates exchange of instant messages, photos, videos, and voice messages using Internet connection. It has gained huge popularity and has been installed over half a billion times in smartphones all over the world (Montag, 2015). It has become one of the most frequently used social media platforms for active communication among people. WhatsApp users use their display pictures to express their personality to their contacts. Unlike certain other social media platforms such as Facebook, where profile pictures can be viewed by anyone on the social media platform, WhatsApp enables users to restrict the people who can view their display picture. In general all individuals can be categorized into five different personality traits, namely: extraversion, agreeableness, conscientiousness, openness to experience, and neuroticism as per the Five Factor Model (FFM) or Big Five Trait Theory.

The literature available related to studies on WhatsApp is relatively less compared to Facebook and Twitter. The aim of this paper is to explore and examine the patterns, possibly indicative of relationships between personality of individuals and the changes in their display pictures over time. This paper initially discusses literature related to the said domain, followed by a discussion on methodology and then presents outcomes of comparing personality traits and display picture

changing behaviour of participants. Furthermore, conclusions are outlined along with limitations of the study and directions for future research.

## **Literature Review**

### **Social Media and its Use**

Social media has become an important part of modern life. Studies show that social media platforms have been used by people for their numerous interactions. It is a platform extensively used by people belonging to all age groups. Previous studies have found that people primarily use social networking sites to facilitate physical interactions and to maintain long distance relationships (Barlett & Anderson, 2012).

Smartphones have become an integral part of an individual's life today, and have thus affected the social media user's day to day activities. One of the primary social media platforms which has contributed to increased usage of smartphones is WhatsApp. Smartphones have a huge impact on users, and WhatsApp has been the main driving force according to Montag et al. (2015). In this study the researchers created an application called "Menthal" to track the WhatsApp usage of each user. A digital consent form was sent to each user before they downloaded the application where they agreed to share their profile data information. The Big Five personality traits were linked to the daily usage rate of the users. Based on the data collected, it was found that a user spends around 161.95 minutes on their smartphones per day out of which 32.11 minutes were spent on WhatsApp. The results also indicated that females spend a longer time on WhatsApp than their male counterparts.

Besides these studies, research linking the selection of WhatsApp display pictures to personality traits of individuals is scarce. Therefore we have chosen WhatsApp as the social media platform for administering this research.

### **Personality and the Big Five traits**

Personality is defined as a combination of traits that are stable over time and help to define a person's character. The Big Five personality traits, also called the Five Factor Model (FFM), refers to five fundamental traits that form an individual's personality – extraversion, agreeableness, conscientiousness, openness to experience, and neuroticism (John & Srivastava, 1999).

According to Barrick and Mount (1991), the first trait of the Big Five model – extraversion – is frequently associated with being outgoing, social, confident, talkative, and energetic. The second trait inferred as agreeableness is associated with being emotional, moody, dejected, irritated, and worried. The third trait conscientiousness is connected with being careful, accountable, and plan-oriented. The fourth trait neuroticism is associated with distress, uneasiness, and pity for oneself. The fifth trait openness to experience is connected with intellect, inclination to diversity, and inquisitiveness.

### **Influence of Personality on Display Pictures**

Millions of people worldwide are connected to families, friends, and peers by being members of various social networking sites. These individuals portray their personality online by posting photos, videos, and texts about/ related to themselves. Many studies have been conducted which show the connection between an individual's personality and the way s/he behaves online. A study conducted by Golbeck, Robles, & Turner (2011) predicted personality of users based on social media usage. The Big Five traits were used as a measure to relate a user's personality with her/ his activity to explore social media (Golbeck, Robles, & Turner, 2011). Amichai-Hamburger and Ben-Artzi (2000) suggested that Internet use is related to personality, and specifically mentioned that introverts benefit more from it as it helps them to socialize easily through social media. In 2009, Ross, Orr, Sisic, Arseneault, Simmering, and Orr examined the link between personality of users and their social behaviour online based on self-reports of Facebook users, and concluded that the relationship was not that strong. On the contrary, Amichai-Hamburger and Vinitzky (2010) conducted a similar study with improvised self-reports but found the connection to be strong.

Numerous research studies highlight the relationship between an individual's personality and the photos and images s/he posts online in social media. A study was conducted by Choi, Sung, Lee, and Choi (2017) on personality and individual differences. The main aim of this study was to find out the social networking behaviour through selfies. They tested the relationship between the Big Five traits and selfie-related attitude, and how individuals maintain online sociability and social connections. It was found that women posted more selfies than men on social media. The authors concluded that social media users' dominant personality traits include conscientiousness and neuroticism. Another study conducted by Whitty, Doodson, Creese, and Hodges (2016) focused on exploring whether personality predicts profile selection as well as image selection behaviour on Facebook and Twitter.

The Big Five personality traits were used to measure the personality of users based on the information collected from an online survey. Based on the study, researchers concluded that the personality of each user influenced her/ his profile photo selection either knowingly or unknowingly.

Studies conducted previously focused on the relationship between personality of users and the photos/ images posted by them online. Eventually the studies narrowed down to focusing on how personality of users affects their selection of profile pictures on social media. Social media platforms these days have become a place where users portray their identity; these online identities represent their profiles and personalities on social media. Amongst several different indicators, one of the major identity indicators preferred by the users is their profile pictures. A study was conducted by Zheng, Yuan, Chang, and Wu (2016) to explore whether gender and region affected the selection of profile pictures by users. The researchers found that the display pictures changing behaviour among users from different localities were different. They also observed that gender played a vital role in facilitating users in choices concerning their profile pictures. On similar lines a research was carried out in Midwestern University using the narcissism personality inventory; the study's findings concluded that narcissism is an important motivator for users in selecting their profile pictures (Kapidzic, 2013). Moreover in a study conducted in 2017, Segalin et al. found that users' personality traits affect their profile picture selection on Facebook. Extraversion and neuroticism were discovered to be the most significant personality traits, and these were used to classify the personality of users. Based on the findings from this study, the researchers concluded that there was relevant information from Facebook to classify the personality traits of an individual. A similar study was conducted on Twitter where personality of users were categorised into 13 categories. Based on the analysis from different categories, it was found that letter and logo users rarely updated their tweets as they didn't want much attention from other users (Tominaga & Hijikata, 2015).

Hence, in light of previous research, the link between personality traits of users and their display pictures seems quite logical and significant. Accordingly, for the purpose of this study we categorized the display pictures of WhatsApp users into 4 different categories – Myself, Social, Distinct, and No Picture. Accordingly, the following hypotheses were formulated:

H1: Individuals who score high on extraversion will update their display pictures categorised under Myself and Social more often than other categories of display pictures.

H2: Individuals who score high on agreeableness will update their display pictures categorised as Social more often than other categories of display pictures.

H3: Individuals who score high on conscientiousness will update their display pictures more frequently as compared to those individuals who don't score high on conscientiousness.

H4: Individuals who score high on neuroticism will update display pictures categorised under Distinct more often than other categories of display pictures.

H5: Individuals who score high on openness to experience will update their display pictures categorised as Distinct more often than other categories of display pictures.

## **Analysis**

### **Methodology**

Our study discusses how the personality traits of users are reflected in their selection of display pictures on WhatsApp. A purposive sample was chosen carefully according to requirement of study based on our prior experiences with the participants, and to account for different personality types. It included friends and friends of friends in our contacts. Data was collected over a period of 6 weeks wherein the display pictures of participants on WhatsApp were noted and recorded on a day-to-day basis. In particular, we divided the profile pictures into 4 categories, namely: (i) Myself (M) which includes all images, photos, and selfies of the user herself/ himself (ii) Social (S) which includes photos of users with her/ his associates including friends and/ or family members (iii) Distinct (D) which includes images or photos of a celebrity, an avatar, quotes, sceneries, objects, etc. (iv) No picture (N) indicates the absence of a profile picture.

Further, the participants in our study responded to an adapted version of questionnaire developed from 50-item International Personality Item Pool (IPIP) scale (Goldberg, L. R., 1992), and was administered online. The structured-undisguised questionnaire used a 5-point Likert scale with

options ranging from strongly disagree-1 to strongly agree-5. This 50-item inventory measures the Big Five traits – extraversion, agreeableness, conscientiousness, neuroticism and openness to experience. These five personality traits were measured using 10 statements each. Responses were recorded and analysed, and participants were grouped according to their scores on each of these traits. This was followed by the users’ personality traits profiling based on their selection of WhatsApp display pictures, and also examining the similarities in display picture patterns of participants possessing the similar personality traits; hence testing the proposed hypotheses.

**Participants**

The purposive sample chosen consisted of 55 participants whose display pictures were noted and recorded. However, due to inappropriate or incomplete responses on the IPIP questionnaire administered online, few participants were screened out. After exclusion, the sample consisted of 25 participants. In this study, major proportion (~62%) of the participants were students; almost 86% of the participants were in the age group of 20-25 years; and 64% of the participants were postgraduates with the remaining 36% were undergraduates.

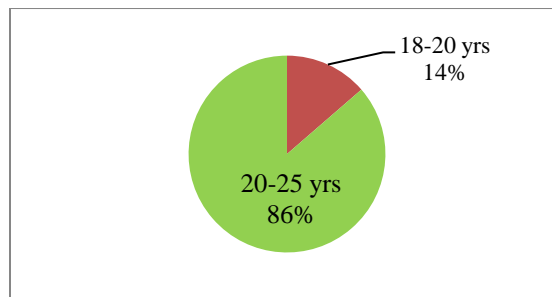


Figure 1. Pie chart denoting age group (%) of participants

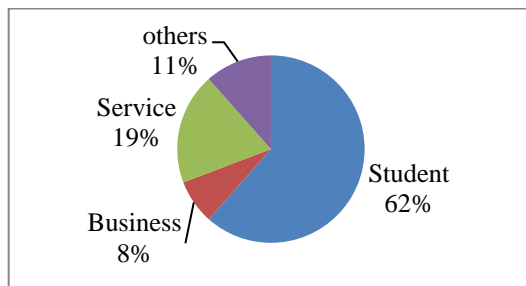


Figure 2. Pie Chart denoting occupation (%) of participants

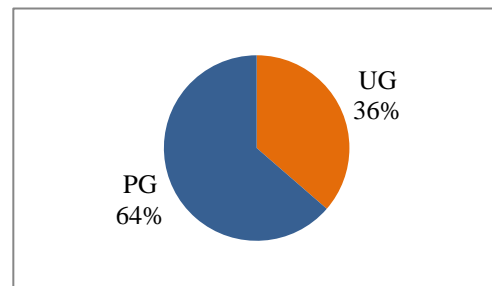


Figure 3. Pie Chart denoting education level (%) of participants



## Results

Our first hypothesis (H1) is concerned with extraversion and how it affects the display picture selection of individuals. On analysing the data obtained, it was found that among participants who scored high on extraversion, display pictures mainly consisted of photos of themselves or photos with family and friends. The results indicate that individuals who scored high on extraversion updated display pictures categorized under Myself or Social ~92% of the time. Therefore, first hypothesis (H1) couldn't be rejected.

The second hypothesis (H2) is rejected as the results indicated that participants high on agreeableness primarily updated display pictures categorized as Distinct rather than Social. We found that participants who scored high on this trait primarily updated display pictures categorized as Distinct ~60% of the time, whereas the proportion of display pictures categorized by them as Social was only ~15%.

With regard to the third hypothesis (H3), we found that participants who scored high on conscientiousness changed their display pictures less frequently as compared to those low on conscientiousness. Therefore this hypothesis is rejected. The results of this study indicate that individuals who scored high on conscientiousness primarily updated display pictures categorized as Myself (~60%), followed by the ones categorized as Social.

The participants who scored high on neuroticism updated their display pictures primarily with images of quotes and avatars. The portion of display pictures categorized as Distinct was quite high (~78%) among individuals who scored high on neuroticism. Hence, based on the findings of this study, fourth hypothesis (H4) couldn't be rejected.

The fifth hypothesis (H5) predicted that those who scored high on openness to experience are less likely to have display pictures of themselves as compared to having quotes and avatars. Our results don't support this hypothesis as it was noted that participants who scored high on openness to experience updated their display pictures under the category of Distinct less frequently as compared to those categorized under Myself and Social. This study found that individuals who scored high on openness to experience largely updated their WhatsApp display pictures categorized under Myself (~53%), whereas display pictures of the category Distinct constituted only ~15% of their display pictures updated in the observed period of 6 weeks. Therefore fifth hypothesis (H5) is rejected.



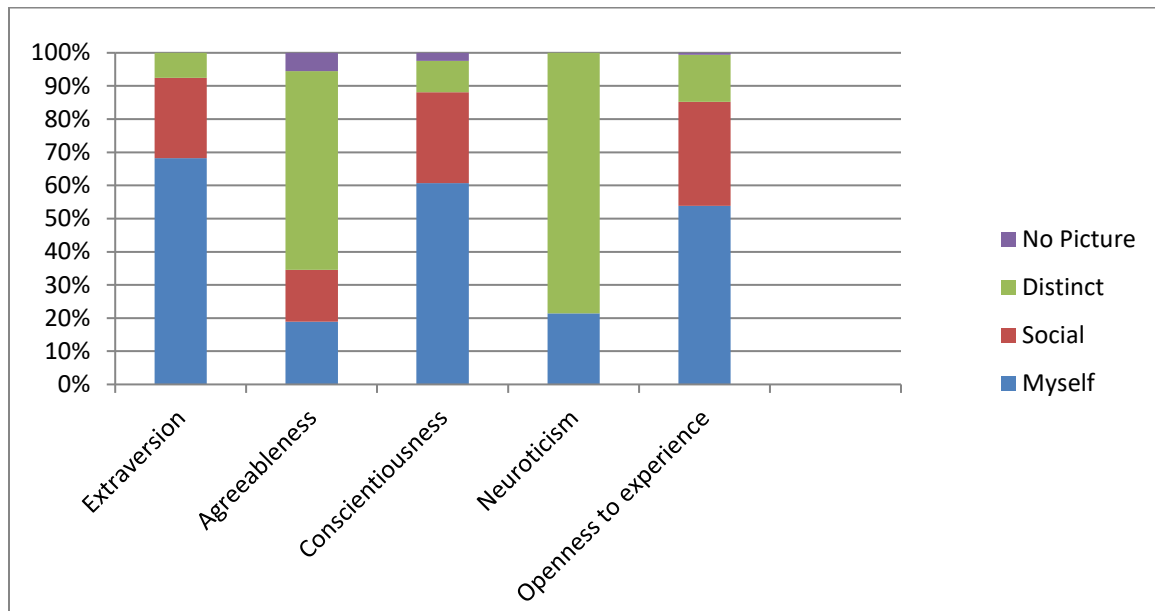


Figure 4. Percentage chart denoting Users' Personality Traits (Big Five) Profiling and their WhatsApp Display Pictures changing trends

## Discussion

This main aim of this study was to find out whether personality of individuals is in any manner indicative of their display picture selection on WhatsApp. In line with previous research conducted on a similar note (Kapidzic, 2013; Zheng et al., 2016), we found that personality of individuals does to some extent affect their selection of WhatsApp display pictures, but not always in complete congruence with our hypotheses. Out of the five hypotheses formulated in this study, two hypotheses are found to give significant results in direction of assumptions, and three hypotheses are rejected.

Our first hypothesis (H1), concerning individuals scoring high on extraversion and their tendency to update display pictures categorised under Social and Myself, is supported by our data. Thus our study adds on to previous research focusing on extroverts and their behaviour online (Wu et al., 2015).

According to the second hypothesis (H2), individuals scoring high on agreeableness are more inclined towards display pictures categorised as Social. This is based on a logical assumption that these individuals are very friendly, warm, and get along well with others. However, the results of our study are contrary to this assumption, and indicate that individuals who score high on agreeableness update display pictures primarily categorised as Distinct rather than Social.

The third hypothesis (H3) which states that individuals scoring high on conscientiousness would update their display pictures more frequently, is rejected. This result is contrary to the findings of Whitty et al. (2016) who found that people who score high on conscientiousness prefer to keep themselves updated and thus change their Facebook profile image more frequently. However, this result is in congruence with the findings of Ross et al. (2009) and Amichai-Hamburger and Vinitzky (2010) who concluded that people who score high on conscientiousness are likely to update pictures on Facebook less frequently and be less active on social media as compared to those who score low on conscientiousness.

The fourth hypothesis (H4), focused on neurotic people and their display pictures changing behaviour. It is based on the fact that individuals scoring high on this trait are more emotional and moody (Barrick and Mount, 1991), and we hypothesised that they would update quotes and avatars according to their mood, i.e., display pictures categorized as Distinct. The results of our study support this argument.

Finally, the fifth hypothesis (H5) predicted that people high on openness to experience are less likely to have pictures of themselves alone or with friends, in congruence with other studies which stated that people who are more open in expressing thoughts and emotions will extend their creativity in selection of display pictures as well (Douglas, Bore, & Munro, 2016). However, the results of our study are contrary to these findings.

Thus the results of the present study revealed that personality of individuals does affect their selection of display pictures on WhatsApp. Moreover, a significant trend in the WhatsApp display pictures changing behaviour of individuals belonging to similar personality groups was also observed.

## **Conclusion**

This research sheds light on personality traits of individuals and how they affect user's selection of WhatsApp profile pictures; in general the role it plays in an individual's portrayal of oneself on a social media platform. The results of our study reveal that individuals who score high on extraversion, conscientiousness, and openness to experience primarily update their WhatsApp profile pictures categorized as Myself and Social; whereas individuals who score high on agreeableness and neuroticism mainly update their WhatsApp profile pictures categorized as Distinct. This study has thus found a link between display pictures changing behaviour of WhatsApp users and their

personality traits. The study also indicates that those people who possess similar dominant personality traits exhibit certain trends in their WhatsApp display pictures changing behaviour.

This research is significant for social media users who portray their personalities for work and personal life, as well as on social networking sites that can personalize advertising and content to better fit their personality traits. Websites such as e-commerce sites and ad servers can also derive the personalities of individuals from their display pictures and use this data to target customers who would be more receptive towards certain product/ service offers. Moreover, entertainment-related websites can also possibly understand personality of an individual from her/ his display pictures, and thus recommend content commonly preferred by individuals with similar personality traits.

### **Limitations and Future Research**

The findings of this study are not in sync with all the hypotheses formulated. Therefore, it is evident that an individual's personality traits are not the only factor which affect her/ his display picture choice as well as display picture changing behaviour. There could thus be several other significant factors which can affect an individual's display picture choice and/ or changing behaviour.

Moreover, an in-depth study involving a much larger and diverse sample couldn't be conducted due to paucity of time and resources. Future research may be conducted over a considerable period of time in order to understand the interactions between display profile pictures and personalities of individuals in a comprehensive manner. Also, involving more participants would result in better understanding of the trends related to individuals with similar personality traits. People from different cultures as well as from different age groups can be considered in order to refine the results further, and make them relatively more generalized. Conducting a research involving multiple social networking platforms like Facebook and Twitter, and comparing results across different platforms would perhaps provide better insights and a broader understanding of the research phenomenon.

### **Acknowledgements**

The authors would like to thank all participants for their time and cooperation. The authors thank Ms. Devika Prakash for her insightful comments and helpful suggestions on several drafts of this research article.

## References

1. Amichai-Hamburger, Y., & Ben-Artzi, E. (2000). The relationship between extraversion and neuroticism and the different uses of the Internet. *Computers in Human Behavior*, 16(4), 441-449.
2. Amichai-Hamburger, Y., & Vinitzky, G. (2010). Social network use and personality. *Computers in Human Behavior*, 26(6), 1289-1295.
3. Barlett, C. P., & Anderson, C. A. (2012). Direct and indirect relations between the Big 5 personality traits and aggressive and violent behavior. *Personality and Individual Differences*, 52(8), 870-875.
4. Barrick, M. R., & Mount, M. K. (1991). The big five personality dimensions and job performance: a meta-analysis. *Personnel psychology*, 44(1), 1-26.
5. Choi, T. R., Sung, Y., Lee, J. A., & Choi, S. M. (2017). Get behind my selfies: The Big Five traits and social networking behaviors through selfies. *Personality and Individual Differences*, 109, 98-101.
6. Douglas, H. E., Bore, M., & Munro, D. (2016). Openness and Intellect: An analysis of the motivational constructs underlying two aspects of personality. *Personality and Individual Differences*, 99, 242-253. <https://doi.org/10.1016/j.paid.2016.05.030>
7. Golbeck, J., Robles, C., & Turner, K. (2011, May). Predicting personality with social media. In *CHI'11 extended abstracts on human factors in computing systems* (pp. 253-262). ACM.
8. Goldberg, L. R. (1992). The development of markers for the Big-Five factor structure. *Psychological assessment*, 4(1), 26.
9. John, O. P., & Srivastava, S. (1999). The Big Five trait taxonomy: History, measurement, and theoretical perspectives. *Handbook of personality: Theory and research*, 2(1999), 102-138.
10. Kapidzic, S. (2013). Narcissism as a Predictor of Motivations behind Facebook Profile Picture Selection. *Cyberpsychology, Behavior, and Social Networking*, 16(1), 14-19.
11. Montag, C., Błaskiewicz, K., Sariyska, R., Lachmann, B., Andone, I., Trendafilov, B., ... & Markowitz, A. (2015). Smartphone usage in the 21st century: who is active on WhatsApp?. *BMC research notes*, 8(1), 331.
12. Ross, C., Orr, E. S., Sisic, M., Arseneault, J. M., Simmering, M. G., & Orr, R. R. (2009). Personality and motivations associated with Facebook use. *Computers in Human Behavior*, 25(2), 578-586.
13. Segalin, C., Celli, F., Polonio, L., Kosinski, M., Stillwell, D., Sebe, N., ... & Lepri, B. (2017, October). What your Facebook profile picture reveals about your personality. In *Proceedings of the 2017 ACM on Multimedia Conference* (pp. 460-468). ACM.
14. Tominaga, T., & Hijikata, Y. (2015, May). Study on the relationship between profile images and user behaviors on twitter. In *Proceedings of the 24th International Conference on World Wide Web* (pp. 825-828). ACM.
15. Whitty, M. T., Doodson, J., Creese, S., & Hodges, D. (2016). A picture tells a thousand words: What Facebook and Twitter images convey about our personality. *Personality and Individual Differences*, 10-14. <https://doi.org/10.1016/j.paid.2016.12.050>
16. Wu, Y. C. J., Chang, W. H., & Yuan, C. H. (2015). Do Facebook profile pictures reflect user's personality? *Computers in Human Behavior*, 51, 880-889.
17. Zheng, W., Yuan, C. H., Chang, W. H., & Wu, Y. C. J. (2016). Profile pictures on social media: Gender and regional differences. *Computers in Human Behavior*, 63, 891-898.