Does a beautiful face play a big role in our professional careers?

A correlation between objective and subjective beauty with a success in professional life and differences in judgment of beauty between different groups of appraisers

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1.Introduction

1.a. Problem statement

Those who are fortunate to be born beautiful or handsome have an edge over others in their public dealings. People all over the world spend millions of dollars to look good. They undergo plastic surgery, visit the beauty parlor regularly and undergo herbal treatments to improve their physical appearance. Why so? I can think of several reasons:

In general people like to impress other people in various social situations, where they deal with the public. If a person looks good it's likely he will also feel good (Sharma & Black, 2001) and it is much easier for a physically attractive person to attract more attention. It is nice to have when building up relationships or making new connections. Physical appearance plays a role in a relationship, for instance in a marriage, the partners ought to take care of themselves physically if they want to have higher probability of sustaining their relationship. It boosts self-confidence and self-respect. A person feels valued and very reassured externally when other people look up to them and might prefer to associate with them as they see them as attractive. In certain professions looks make a lot of difference, besides the obvious ones as models or actors, there are also several business-related jobs, a good looking salesperson will get noticed quickly or good looking CEO can drag the stocks of a company higher in the moment of announcement (Halford & Hsu, 2014). Similarly, a handsome politician can draw extra attention of the masses. For example, former president of the USA John F. Kennedy was known for his looks, which enhanced his public image.

Previous studies show that attractiveness has a positive impact on individual income (Pfeifer, 2012), social status in a group (Kennedy, 1990), election outcome (Berggren, Jordahl & Poutvaara, 2010) and value of personal loans (Duarte, Siegel & Young, 2012). Benefits of attractiveness is certainly a topic, which is worth examining deeper.

This paper focuses on a correlation between the attractiveness of higher executives or executives from more successful companies compared with level of attractiveness of lower executives or executives from less known and financially less significant companies. As stated above, there are lot of reasons why such a correlation might exist. The first impression matters and the less time the person have to spend with another person the more important appearance is becoming. A

good looking person might be viewed as more trustworthy, ambitious and able to perform a task or more people might be willing to listen what he has to say since his communicational and social skills are at a high level thanks to higher confidence (Mobius & Rosenblat, 2006). Such a person can wrongfully appear more capable and it is easier for him convince an employer to raise his salary or succeed when fighting for a promotion. These could be some of the reasons why a correlation between appearance and career could exist. The first step is to see if there is a relationship between these factors.

1.b. Research question

In this paper I will compare attractiveness of management on different posts in several companies and look for a correlation with their perceived beauty judged by student appraisers and two different apps. Therefore the main hypothesis of this thesis is:

There is a correlation between the perceived attractiveness of managers and their success in professional career.

Fortune 1000 is a ranking list published by the American business magazine Fortune. The list consists of the 1000 greatest American companies, ranked by revenues. Eligible companies are any which are incorporated or authorized to do business in the United States, and for which revenues are publicly available (this list has a larger universe than "public companies", as the term is commonly understood, meaning "companies whose common stock trades on a stock market"). I will test the hypothesis by selecting managers from different Fortune 1 000 companies. The focus will lay on one hundred highest firms and the lowest one hundred of the list. The paper will attempt to find a relationship between the success of a professional success of a manager and his looks. The distance between the top well-known companies and bottom hundred should be large enough for a difference in beauty perception of its employees to show. The executives belonged to companies like Johnson&Johnson, Synopsys, Microsoft, and Allison Transmission.

In this paper a physical appearance will be used as basis to judge attractiveness of the executives through photographs. All of the managers mentioned is the paper are part of senior management teams in either high (top 100) or low (bottom 100) companies of the Fortune 1 000 list. There is an old proverb “beauty is in the eye of the beholder” (Martin, n.d.), which proposes and idea that

beauty is a matter of taste and could be very subjective. This might provide a comfort for people who score lower on different beauty measurements, but unfortunately it is probably not completely true.

Research into attractiveness has shown that good looking people will be generally find attractive by most people, proving that there is some objectivity in beauty after all. The most common way how to rate the attractiveness of a person is to look on the symmetry of the face. Other factors such as cultural background, race or weight, if it is in reasonable boundaries, do not play decisive role in people's perception of beauty. (Hamermesh, 2011) Therefore face symmetry will be used in this paper as a beauty discriminator. Research provides several explanations that facial beauty is perceived through symmetry (Rikowski & Grammer, 1999), facial averageness (Langlois & Roggman, 1990) and probably the most famous one, the golden ratio (Schmid, Marx & Samal, 2008), which will be used in this paper to determine objective beauty (Atalay, 2004).

The mobile apps for Android mobile phones, which will be used are Golden Ratio Face and nFace. Both of these apps use facial symmetry, facial structure and the golden ratio to calculate the beauty of people on the pictures. A symmetrical face usually show that we are healthy and strong to potential mates and people have a built-in ability to judge attractiveness in people. From the early age as infants, we can evaluate people to be good looking or not attractive. (Langlois, Roggman, Casey, Ritter & et al, 1987). Therefore this paper will also use student appraisers to judge attractiveness of the executives. 606 students between the age of 18 and 25 have judged 24 pairs, consisting every time of one higher and one lower executive, to confirm or disconfirm the hypothesis, which suggests that the higher managers should be perceived as more beautiful.

If this hypothesis would be shown to be true it would imply that it is indeed beneficial for an individual to be perceived as better looking in relation to his/her professional career, income rate or likelihood to be promoted. It would imply that the symmetry of a face, which is to a large extent inherited or genetic has great implications for personal and professional life of a person. Moreover, as the example of good-looking CEO acquisition showed, attractiveness can even have impact on the stock price of large firms. Just an idea of one person's face being able to create such a difference on a global scale is unbelievable.

1.c. Relevance of the topic

This research is adding new insights to the topic of attractiveness and since it has both subjective perception of beauty provided by appraisers and objective measurements calculated by mobile applications the results should be less biased and relatively objective. It also compares and provides insights of three separate data sets, one comes from people judging the beauty of managers in the questionnaire and other two comes from two independent apps, which use calculations of symmetry and distances between face parts. Therefore, the conclusions should account for a big part of subject of examinations and provide easily generalizable insights.

There is a lot of research done with relation to personal profitability of good looks, but it might be interesting to look deeper, how we can use it for marketing. From marketing perspective, lots of products could be advertised using means-end chain (Reynolds & Gutman, 1984) which are focused on young motivated professional who wants to get to the top and stressing the importance of good looks. A good products to be advertised in connection to future success could be watches, suits, haircuts, skin products for men and cosmetics, perfumes, dresses, jewelry, shoes and hair products for women. Also interesting insights might come from understanding which target groups perceive beauty more sensitively than others, or which appraisers are more critical. That would allow for ads more suitable for a target audience, based on its perception of beauty or sensitiveness to it. In this paper I will argue that women are more detail oriented when appraising beauty, while men focus on the big picture. If it shows to be true it could add value to targeting in marketing.

The rest of this paper will be organized as follows. First I will address previous studies on beauty topic and their conclusions, which might be applicable to this research in the Literature review followed by the division of the main hypothesis to several sub-hypothesis, both these parts are part of Theoretical Framework. Next, in the Experiment methodology, I will demonstrate how the data for the Golden Ratio Face and nFace analysis and the interview survey was gathered and analyzed. The findings will show all the statistical analysis, followed by the conclusion and discussion, which is a summary of the whole paper. This part will consist of answers to research questions and academic plus managerial implications as well. Lastly I will list the limitations and what would be interesting to look at in further research and the references and appendices.

2. Theoretical Framework

2.a. Literature review

Previous studies show that attractiveness has a positive impact on individual income (Pfeifer, 2012), social status in a group (Kennedy, 1990), election outcome (Berggren, Jordahl & Poutvaara, 2010) and value of personal loans (Duarte, Siegel & Young, 2012). A good looking person might be viewed as more trustworthy, ambitious and able to perform a task or more people might be willing to listen what he has to say since his communicational and social skills are at a high level thanks to higher confidence (Mobius & Rosenblat, 2006). Benefits of attractiveness is certainly a topic, which is worth examining deeper.

Lot of studies have focused their attention on attractive people and traits we deduct from their appearance. The stereotype about physical attractiveness (Aronson & Aronson, 2008) is the inclination to couple different socially desirable traits with beauty. Better looking people are perceived to possess superior social skills (Goldman & Lewis, 1977), to have higher intelligence and healthier mentality higher (Jackson, Hunter & Hodge, 1995). There is a big count of studies which argue that attractive people have been judged to have unreasonably more positive and unrelated traits just because of their good looks. The most common character traits they are perceived to carry are self-assertion, dominance, loyalty, integrity (Dion, Berscheid & Walster, 1972), interest in other people (Wheeler & Kim, 1997) and credibility (Wilson & Eckel, 2006). All of this associations are assigned to people just because of their looks, which is in my opinion kind a sad or shallow, but looks like it is a hard truth. That shows how inheritance of a beautiful face can be a big asset for a life of an individual. The benefits of having a beautiful face is not limited only to getting free positive traits, but good looking people are often treated better by others as well.

Between social benefits that magnificent people get belongs better treatment by others and they have larger social influence or impact (Hamermesh, 2011). People tend to listen more and give more attention to them (Dion, Berscheid & Walster, 1972) and are keen to be more open and honest while talking to them or open faster in general (Brundage, Derlega & Cash, 1976). The most important benefits from the professional life point of view are social or employment opportunities. Fine-looking people are more likely to find a nice vacancy and as mentioned above

they are likely to get payed better (Pfeifer, 2012). What's more they are seen as being happier in general (Dion, Berscheid & Walster, 1972). Our expectations are much higher from attractive people right from the childhood, as teachers are a bit discriminating and tend to see prettier children as more talented, academic and probable to be successful in life (Hunsberger & Cavanagh, 1988). The children are preferred right from the beginning what gives them a competitive advantage and increases their chances for success both in professional and personal life. Also grading can be affected by the favoritism (Byrnes, 1988). Being pretty has benefits also in case that the person plans to commit a crime. More attractive people have had more favorable sentences compared to less physically gifted individuals when charged with the exactly same crime (Efran, 1974).

There is an old proverb "beauty is in the eye of the beholder" (Martin, n.d.), which proposes and idea that beauty is a matter of taste and could be very subjective. This might provide a comfort for people who score lower on different beauty measurements, but unfortunately it is probably not completely true.

Research into attractiveness has shown that good looking people will be generally find attractive by most people, proving that there is some objectivity in beauty after all. The most common way how to rate the attractiveness of a person is to look on the symmetry of the face. Other factors such as cultural background, race or weight, if it is in reasonable boundaries, do not play decisive role in people's perception of beauty. (Hamermesh, 2011) Therefore face symmetry will be used in this paper as a beauty discriminator. Research provides several explanations of how facial beauty is perceived like symmetry (Rikowski & Grammer, 1999), facial averageness (Langlois & Roggman, 1990) and probably the most famous one, the golden ratio (Schmid, Marx & Samal, 2008), which will be used in this paper to determine objective beauty (Atalay, 2004).

Merely by seeing facial expressions of people we should be able to deduce their qualities such as competence and trust (Sell et al., 2009). Due to evolutionary needs, the human brain has evolved neural networks that detect beautiful faces and direct attention towards them (so-called subjective beauty) (Miller and Todd, 1998; Thornhill and Gangestad, 1999). In general, we as people no matter our age or gender, agree on attractiveness or beauty on a judged person and it does not matter if it is a male or female (Langlois et al., 2000; Rhodes, 2006; Thornhill and Gangestad,

1999;). Based on one theory beauty signals biological quality both in females and males, especially with regard to healthier off springs or a health status of a potential mate and his overall performance (Lailvauz and Irschick, 2006). Character traits can be inferred by physical cues (so-called objective beauty) like facial symmetry or averageness (Little et al., 2011; Rhodes, 2006; Miller and Todd, 1998).

One can profit on being able to detect facial beauty in other people. The skill has several indirect and direct benefits. First benefit is connected with safety, because better looking mate is supposed to be stronger and healthier, thus more competent to provide protection in time of need. The appraiser should be more safe with regard to health, because the appraised person, which is good looking, should carry less diseases, thus ensures that investments made in him will pay off, what builds trust as well (Little, et al., 2011). The idea of attractive people having major benefits in society and work has been around for a while and is in line with what some of economists proclaim (Hamermesh, 2011). Second benefit is indirect and more long-term, when people's detection of beauty helps them to find a right mate, thus guarantee healthy and beautiful offspring (Little et al., 2011; Miller and Todd, 1998). In this second assumption, facial beauty is perceived as a sign of good genes, and people should naturally opt for a beautiful mate since theirs facial traits are inheritable (Little et al., 2011; Maestripieri et al., 2014).

Other studies provide a different explanation and do not agree with statement of biological quality being indicated by facial beauty. They see facial beauty as a way of appraised person to lure the appraiser into his power and provoke sexual attraction without providing any real value underneath in the form of good genes and possible healthy off springs (Kalick et al., 1998).

The third alternative opinion proposes that evolution formed people in the way so they would be able to appraise beauty and majority would prefer symmetry in faces, with age of the appraiser making no difference (Langlois et al.; 1991). Probably the most important argument of beauty being the decisive factor, which can predict biological quality is that quality of genes is too broad a concept consisting of many elements and to generalize it just to a facial beauty is a major simplification. Between other important indicators is parental care, health, fertility, intelligence, immunity, good genes or epigenetics (Miller and Todd, 1998). More focused and deeper research strategies are needed to examine true discriminators of good genes and its relationship with facial beauty (Kalick et al., 1998; Thornhill and Gangestad, 1999).

From the early age as infants, we can evaluate people to be good looking or not attractive. (Langlois, Roggman, Casey, Ritter & et al, 1987). Young people, which are forming group of respondents of this study, have well developed specialized brain modules for ranking facial beauty (Langlois et al., 1991; McKone et al., 2012), therefore I expect them to appraise the higher executives as more beautiful than the lower executives, because the former should have better facial symmetry based on the assumptions of this paper with gender not playing significant role (Saxton et al., 2006). Moreover, Rhodes (2006) believes that the symmetricity of a face when appraising indicates an evolutionary evolved neural network that evaluates appraised people higher on attractiveness.

All of the mentioned theories make it sound like life of beautiful people is much easier and yields only positives. But as it works in life, there are disadvantages to everything, also being good looking is not just walk in a park. Better looking people might be confused if other people like them for who they are or only because of their looks. Some studies found a correlation between being attractive and not being honest or caring for other people (Jackson, Hunter & Hodge, 1995). Attractive people might realize what their strength is and become over dependent on their looks. Other people tend to associate some of the less favorable traits with beautiful individuals like egocentrism or vanity and likely to think of them as manipulative or shallow (Gallucci & Meyer, 1984). It happens often that beautiful people might find hard to connect with some people or make friends because of their jealousy towards them (Mazur, Hatfield & Sprecher, 1987).

2.b. Hypothesis development

The literature review section of this paper researches studies that argue for several direct or indirect benefits of attractiveness. Being attractive influences all the aspects of our lives. In professional life the road to success might be easier, the attractive people can get higher salaries, get a higher loan or be perceived as being more capable. From personal point of view they are perceived to carry many positive traits like higher intelligence, better mentality, stronger personality, loyalty or being happy just for their appearance. In social life they are believed to possess superior social skills, they have bigger social influence, are better treated by others, get more attention easily, they are positively discriminated by teachers and people are more willing

to open to them. Another area of advantage is mate acquisition, where they are seen as healthier, strong, able to provide better offspring. All of this benefits make me believe that there must be a correlation between a level of attractiveness of a person and his professional career success. For this reason the first and main hypothesis of this paper states as follows:

Hypothesis 1:

There is a correlation between the perceived attractiveness of managers and their success in a professional career.

To address this hypothesis I will need to derive several partial hypothesis, which will built up a case this paper is attempting to prove. First I start by dividing the first hypothesis into two sub-hypothesis. The most common way how to rate the attractiveness of a person is to look on the symmetry of the face. Other factors such as cultural background, race or weight, if it is in reasonable boundaries, do not play decisive role in people's perception of beauty. (Hamermesh, 2011). Therefore face symmetry will be used in this paper as a beauty discriminator. Research provides several explanations that facial beauty is perceived through symmetry (Rikowski & Grammer, 1999), facial averageness (Langlois & Roggman, 1990) and probably the most famous one, the golden ratio (Schmid, Marx & Samal, 2008), which will be used in this paper to determine objective beauty (Atalay, 2004).

To judge objective beauty mobile apps for Android cell phones will be used, namely Golden Ratio Face and nFace. Both of these apps use facial symmetry, facial structure and the golden ratio to calculate the beauty of people on the pictures. A symmetrical face usually shows that we are healthy and strong to potential mates. The first sub-hypothesis will be as follows:

Hypothesis 1a:

The objective beauty of the higher executives working in the top firms is higher than the beauty of the lower executives working in the bottom 100 firms of the Fortune 1000 list, measured with an objective beauty analysis program, Golden Ratio Face.

Hypothesis 1b:

The objective beauty of the higher executives working in the top firms is higher than the beauty of the lower executives working in the bottom 100 firms of the Fortune 1000 list, measured with an objective beauty analysis program, nFace.

There is an old proverb "beauty is in the eye of the beholder" (Martin, n.d.), which proposes and idea that beauty is a matter of taste and could be very subjective. People have a built-in ability to judge attractiveness in others. From the early age as infants, we can evaluate people to be good looking or not attractive. (Langlois, Roggman, Casey, Ritter & et al, 1987). Therefore this paper will also use student appraisers to judge attractiveness of the executives. 606 students between the age of 18 and 25 have judged 24 pairs, consisting every time of one higher and one lower executive, to confirm or disconfirm the hypothesis, which suggests that the higher managers should be perceived as more beautiful. For the purpose of the third sub-hypothesis we will create a term subjective beauty since it's judged by appraisers.

Hypothesis 1c:

The subjective beauty, judged by appraisers, of the higher executives working in the top firms is higher than the beauty of the lower executives working in the bottom 100 firms of the Fortune 1000 list.

The generalized Trivers-Willard hypothesis (gTWH) proposes a suggestion that there is a higher probability of physically attractive parents to have daughters as their first child in comparison to physically less attractive couples. The data from both National Child Development Study (NCDS) in the United Kingdom of Great Britain and the National Longitudinal Study of Adolescent Health (Add Health) in the United States of America support this theory.

If better looking parents have a higher chance to have daughters, and if we could assume that physical attractiveness stays in the family and is heritable, then by simple logic, over several generations, given long enough time, the average level of physical appearance among women should increase little by little and on the other hand the average level of handsomeness of men should gradually decline. No matter what the initial situation was, if women were more attractive

than men or on contrary men were leading in the beauty rankings, the final outcome ought to be that women will on average become the prettier gender.

If we would analyze data from the above mentioned Add Health and NCDS we would find out that, at least in USA and UK, girls are indeed perceived as better looking on average. As we can see in Graph 1 and 2 (see Appendix), a majority (56.03%) of the appraised girls were either "attractive" or "very attractive," while the figure combing these two categories among boys is significantly lower (41.75%). A majority (51.21%) of the appraised boys were "about average." And if we look at the highest category with regard to beauty "very attractive.", we can see that girls are represented almost twice as much (19.53%) compared to boys with only (10.51%). Therefore the second hypothesis will be proposed as follows:

Hypothesis 2:

Women in managerial positions are more attractive than the men in managerial positions.

In the same manner as the first hypothesis, I will divide it into 3 separate sub-hypothesis each of them representing different source of data:

Hypothesis 2a:

The objective beauty of women in higher executive positions is higher than the beauty of the men in higher executive positions and the same logic applies to lower executive women versus men, measured with an objective beauty analysis program, Golden Ratio Face.

Hypothesis 2b:

The objective beauty of women in higher executive positions is higher than the beauty of the men in higher executive positions and the same logic applies to lower executive women versus men, measured with an objective beauty analysis program, nFace.

Hypothesis 2c:

The subjective beauty, judged by appraisers, of women in higher executive positions is higher than the beauty of the men in higher executive positions and the same logic applies to lower executive women versus men.

The next hypothesis will shift focus from the beauty of appraised pictures to the appraisers themselves. As I already mentioned before, the old saying that beauty is subjective depending on the person who is judging it, might not be completely true. Recent studies looked on the brain activity of men and women while they were watching something beautiful to them and their brains did not react in a same fashion. The male brain showed less activity compared to the female brain. To process the beauty men's brain uses only the right side of the brain when looking on a beautiful picture, meanwhile women's brains was more active on both sides. These new findings were found in Madrid at the San Carlos Clinical hospital.

The researchers think that the difference in findings is connected to the different patterns in which women and men process spatial information. One explanation could be that men probably look at the picture as a whole, but women focus on the smaller details as well. The researchers used magnetic resonance imaging to monitor activity in the brains of participants as they showed them 10 women and 10 men pictures of varying beauty, including a countryside of Capri by the painter Francisco Pradilla Ortiz from the 19th century, and an image of a city centre street.

It lasted about 3000 milliseconds to react for both genders, and the biggest brain activity was measured in the parietal lobe. In men, the brain activity was concentrated only on the right hand side of the brain. The parietal lobe is believed to evolve immediately after the split of chimps and humans. The research conducted by Francisco Ayala, from the University of California, therefore assumes that the difference in perception of beauty arose already among our earlier ancestors.

"The different strategies used by men and women in assessing aesthetic preference may reflect differences in the strategies associated with the division of labour between our male and female hunter-gatherer hominin ancestors," (Ayala, 2012).

Hypothesis 3:

Women and man use slightly different approach to appraise beauty, therefore I expect them to assign different attractiveness scores to people.

The last step in this research is to compare the results from the two facial symmetry apps and the outcome of the survey conducted via questionnaires. Each of these three studies should bring

valuable insights and an extra perspective to the research topic. I believe that the correlation between the attractiveness trait and the success in a professional life, meaning working in a more globally successful company, will be proved right and the results should be consistent over the datasets. The first two tests use analytical measurement and provide an evaluation of so-called objective beauty, while the last dataset relies on individual, more subjective, preferences of people. Together they should provide a valid result explaining a big portion of the question if the beauty is really playing a big role in our careers. The conclusions of the analysis should be easily generalized and could be possibly applied to more situations concerning relationship of attractiveness trait and working life. If all of the three separate tests reflect the correlation between the professional success of the executives and their appearance that would make a strong case in the favor of the main hypothesis of this paper. Thus:

Hypothesis 4:

The objective beauty analysis apps, Golden Ratio Face and nFace, and the subjective beauty survey will yield the same results concerning the impact of attractiveness of executives to their professional success.

Once the analysis of all the datasets will be done we will know more about the existence of the correlation between the attractiveness and business success and hopefully the case that was made in the literature review will be supported. Each of the sub-hypothesis can bring new insights into the research with an assumption that the analysis through the apps should show very similar results and hopefully it will be in line with the outcome of the survey. The second hypothesis will also add additional information about perceptional differences between genders and possibly confirm the stereotype of woman being the prettier sex. The third hypothesis tries to examine other side of the equation, which is differences between the appraisers of beauty. This question can help understand how different segments of people perceive beauty and could provide more information for targeting them accurately. Finally, the last hypothesis attempts to put all of the different sources together in search of result, which could be as objective as possible and easily generalizable.

Another important reality to acknowledge is that we are talking just about correlation and not causality. Therefore we cannot say that being beautiful will make you successful, because it might be the other way around. The level of attractiveness could be just a moderator or a mediator and the real

reason could be hidden somewhere deeper. What if being successful makes people more confident and more attractive to other people in return. It could be easily the case, since many people tend to acquire a big deal of confidence after having some success in professional life, climbing higher the social ladder or acquiring social status. In this paper I take into account subjective and objective beauty to find an outcome explaining the most of the relationship, but one variable could be still missing and that is how the person perceives himself. From my personal experience I can say that there is lot of ugly confident people and lot of beautiful people, which are not confident at all. If the person likes himself and feels good about him, he should be perceived as more beautiful by others because of the confidence or more mysterious terms as character, energy and most importantly should think he is better looking. Another explanation could be that even personal success affects professional life. People who acquired mate they are proud of or have satisfactory family life might be happier and in result more confident and seen as more beautiful by others. Maybe everything is much simpler and the more successful the company is the more professional demands are put on its employees with regard to clothing, style or taking care about the appearance in general. Since top companies care more about the look, they might also higher more professional photographer for taking the company pictures. People are the face of the company after all.

3. Methodology

In this section I will first explain how the data was selected and collected. Then I will provide a short description of the Golden Ratio Face application, what restrictions have to be met, how the algorithm works and have a look at example outcome of an analysis. After the description of nFace application will be provided and in case there are differences those will be discussed in a short comparison. The two parts will also contain description of variable. Next the process of survey creation, distribution and how the results were gathered will be explained. Limitations of the survey and ideas for improvement will be mentioned as well. Finally we will discuss the method used to analyze the survey data.

We will start by explaining from which companies were the executives chosen and how these companies were selected. The companies were selected from the Fortune 1000 list. Fortune 1000 is a ranking list published by the American business magazine Fortune. The list consists of the

1000 greatest American companies, ranked by revenues. Eligible companies are any which are incorporated or authorized to do business in the United States, and for which revenues are publicly available (this list has a larger universe than "public companies", as the term is commonly understood, meaning "companies whose common stock trades on a stock market"). I will test the hypothesis by selecting managers from different Fortune 1 000 companies. The focus will lay on one hundred highest firms and the lowest one hundred of the list. The list is an extension of the more famous Fortune 500 list and all of the managers were chosen from the firms in it. The list itself also serves as a base for comparison of professional success of managers, because it is well-known and generally accepted is objective pointer of the success of the US companies. The paper will attempt to find a relationship between the success of a professional success of a manager and his looks. The distance between the top well-known companies and bottom hundred should be large enough for a difference in beauty perception of its employees to show. The top US firms are global therefore the mix of managers should consist of several nationalities or people with roots from all over the world, therefore the sample shouldn't be biased. Not mentioning that the US are already representative containing many different races.

From the Fortune 1000 list six firms were selected to choose the executives for the analysis. One half of the firms are the top 100 and the second half of the firms are the bottom 100. The firms were chosen in such a manner to make the distance as big as possible in order to increase the chance of finding the difference in attractiveness of managers and consecutively to increase a chance of spotting the correlation. The Fortune 1000 list is a nice representation of the best American companies with regard to revenue, but it might be the case that the distance is still not big enough to spot any significant differences in the attractiveness of managers and a it would not hurt to use companies with even bigger gap to provide higher possibility of finding interesting results. This research focuses on the attractiveness levels of the managers and uses ranking in the Fortune 1000 list only to get a baseline for success of the managers in search for a correlation, so the exact revenues are not interesting. What matters is that top firms are higher on the list than the bottom ones. The exact size of the difference in revenue, is not in the scope of this paper as there are countless factors combined, which form a revenue of a company. Attractiveness of managers might or might not be one of the many factors and it is not feasible with such a small amount of

information to determine the magnitude of the effect. We can only speculate, but it could account maybe for one percent of the revenues? Two percent? Half a percent? It would certainly not explain a lot of the variance in the revenue. Since there is no causality in my research, knowing the exact differences in revenues will not any additional value. All of the companies were chosen in such a manner that pairs were formed to control for a case when some industry would have more good looking people than other industries. The industries were chosen randomly from the wide variety of industries that are offered in the list. The only condition was that in each industry, there was one firm from the top and one from the bottom 100 of the ranking and each firm had to provide public information about current managers online, including pictures of the management.

The categories chosen were pharmaceuticals, motor parts and computer software. There were created pairs in the following fashion: Alexion Pharmaceuticals (position 941), Johnson & Johnson (position 37), Allison Transmission Holdings (position 974), Johnson Controls (position 66), Synopsys (position 995), Microsoft (position 31), respectively per industry. All the firms are active in both business to consumer and business to business. They are doing business in different production fields selling products, services or a mixture of both. This means the results will be representative for larger group of firms since the chosen industries are heterogeneous.

Photographs of the senior management were collected from each firm. By using photographs it is possible to isolate beauty from other personal traits like charisma, confidence, sound of their voice or behavior playing a role, which makes the result more controlled. There were several requirements for the pictures like they had to be from the front side ideally showing the whole face, to be clear of any spots, identifiable for analysis and last but not least to be of a high quality so the facial features would be clearly identifiable. Additional restrictions for Golden Ratio Face, nFace and the experiment were also considered and will be explained in detail later. The style in which were the pictures collected was as follows, first they were downloaded from the company's website and then Google images were searched, for possible pictures that may be of a higher quality. The goal was to find pictures of as many executives as possible which resulted with having around fifteen photographs per firm. This was more than needed, but there was no guarantee about the number of pictures which were available in the time of collection and it is always wise to have a little backup.

Since the second hypothesis suggests that there is a difference in perceived beauty of men and women we had to try to make the balance between the genders. Women in senior management positions are rare, that is why our final ratio is skewed a bit towards having more women in the sample than what is the reality in the firms. For instance, in the motor parts industry, the number of women senior executives was around ten times lower compared to men. This fact has to be taking into consideration while interpreting the results of the analysis.

To choose eight or nine pictures from the options we opted for completely random selection process where I attached fifteen numbers to fifteen dog food cakes and threw in the in the air in the middle of our garden at home. Then waited until the dog ate first six or seven cakes, the remaining numbers were chosen as a pictures for the questionnaire. The pictures ate by my dog where deleted from the survey so there was eight to nine images left. The process was repeated six times for each firm separately. After the random selection process was done, there were left 50 pictures, which consisted of 25 managers from the bottom 100 companies, Alexion Pharmaceuticals, Allison Transmission Holdings and Synopsys and 25 executives from the top 100 companies, Johnson & Johnson, Johnson Controls and Microsoft. From the 25 pairs of executives, one pair was deleted to avoid bias in the appraising of beauty, since there was Bill Gates, who is well-known to general public and could not be judged only on base of his appearance. These 48 executives, who were left, were used throughout all of the different analysis, for the objective measurements using Golden Ratio Face and nFace and for the subjective beauty appraising using the survey distributed between students of my thesis leading professor. After the individual analysis the results will be compared to see if there is an overlap in findings. This will allow for confirming or disconfirming the hypotheses and serve as a base for drawing conclusions. In the measurement of objective beauty both applications will provide us with a facial analysis resulting in a score ranging from 1 to 10. The second method attempting to appraise subjective beauty uses survey where respondents see pairs of executive, one high and one low every time, and have to choose on the Likert scale (1 to 7) what score will they assign to each picture. That way it is easy to compare assigned score of all of the 48 pictures and use a little more advanced analysis compared to situation when appraisers would just choose who is better looking out of the pairs.

3.a. Golden Ratio Face

Golde Ratio Face uses facial symmetry, facial structure and the golden ratio to calculate the beauty of people on the pictures. The authors also state that a symmetrical face usually show that we are healthy and strong to potential mates and people have a built-in ability to judge attractiveness in people. To get an objective result it is advised to use a picture with neutral face expression and a head should be directed straight to the camera. Turning the head might affect the final result, same thing happens if the hairline and ears are not visible. The app uses the Marquardt Beauty Mask to judge the beauty and several different distances based on the golden ratio (1.618). The distances measured are an eye width, distance between the eyes, nose width, mouth width, ears height and a distance between the ears and many more. To determine you facial beauty score there are two simple steps needed. First, you take a new picture or upload a picture from your device and second press the button and see the actual result. The facial analysis results in a score ranging from 1 to 10. To analyze the score provided by the app you can use following guideline:

- Perfect face = score above 9
- Beautiful face = score between 7.5 and 9
- Normal face = score between 5 and 7.5
- Ugly face = score under 5

Each of the 48 managers were checked for the requirements of Golden Ratio Face during collection and rotated if the picture was not taken directly from the front. The images were uploaded directly to the app and run through the assessment process. All of the 48 pictures were uploaded and scored twice to correct for some occasional mistakes in measurement and the results were written down. This gives us an ordinal variables as a person can be scored as more attractive than other and ordered by a rank. The pictures were analyzed in random order through the Application. By using two individual scores for each picture it was possible to compare it easily and asses the reliability of the application. The app proved to be very exact, provided the same score most of the time, therefore the two measurements were not significantly different from each other and we can use them to address the hypothesis.

An example of a result from Golden Ratio Face using my father (Figure 1):

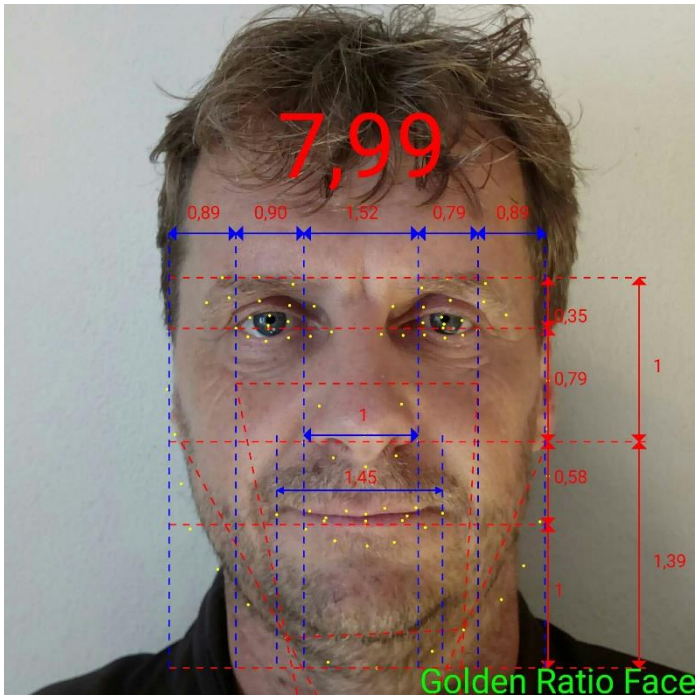


Figure 1: Golden Ratio Face example analysis of my father.

An example of the Marquardt Beauty Mask applied on my father's face (Figure 2):

Figure 2: An example of the the Marquardt Beauty Mask applied on my father's face.

The application does not include assessment of facial traits and image characteristics that build up a complete picture of attractiveness and does not control facial features, which could have an impact on the score. If someone is not looking directly forward, have a moustache, is older, is bold or wears a moustache, all of these factors can alternate a result. Another aspects that might change an outcome are connected to the quality of a picture like a degree of professionalism, lighting and resolution. These factors provide an extra reason to compare several sources of data and methods of analysis. Results of Golden Ratio app will be first compared with nFace results, which uses similar form of measurement and subsequently compared with the student survey results. If the result of all of the three data sets would be in line that would increase the probability of existence of the correlation I am trying to find. Even if the traits and features matter in an attractiveness score, the subjective beauty judged by people will account for this, since people notice these differences and that way the traits will find their way into the final result. To research deeper this details is beyond the scope of my topic, but might be an interesting idea for future research.

3.b. nFace

nFace is much more simpler application compared Golde Ratio Face. Really good facial symmetry software is hard to find and nFace serves in this paper more like a tool for comparison with the Golden Ratio Face application. It will be interesting to see if both applications will yield comparable outcomes. Contrary to facial symmetry or facial structure analysis, which is used by the Golden Ratio Face, nFace detects shape descriptor points of a face and provides an attractiveness score based on this analysis. Requirements for obtaining high quality results are similar to those of the first app, the user should provide a picture with neutral face expression and a head should be directed straight to the camera. To determine you facial beauty score there are two simple steps needed. First, you take a new picture or upload a picture from your device and second press the button and see the actual result. The facial analysis results in a score ranging from 1 to 10.

An example of a result from Golden Ratio Face using my father (Figure 3):

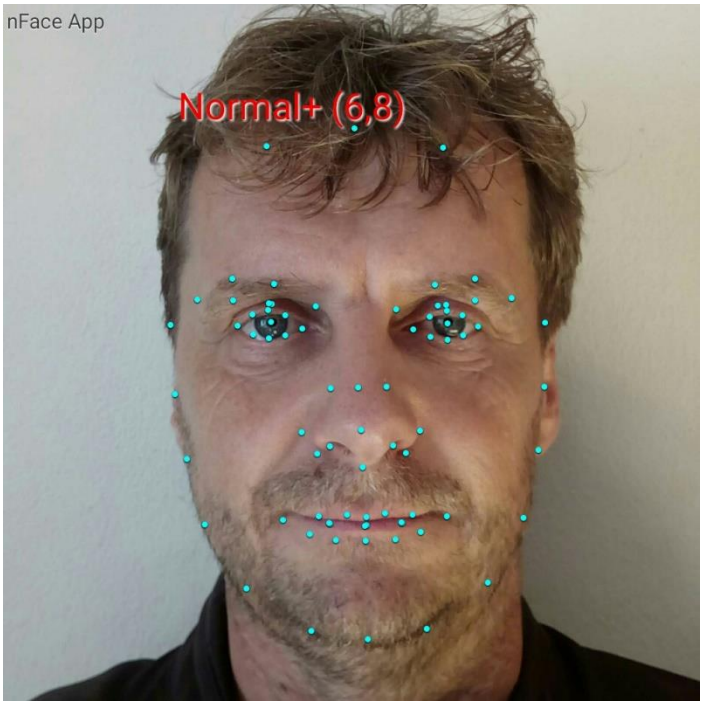


Figure 3: nFace example analysis of my father.

Each of the 48 pictures of managers were uploaded directly to the application and run through the analysis. The score was taken twice to correct for measurements mistakes, since nFace is less reliable app and the results were written down. This gives us an ordinal variables as a person can be scored as more attractive than other and ordered by a rank. The pictures were analyzed in random order through the application and by using two individual scores for each picture it was possible to compare it easily and asses the reliability of the application, which is not very high. The app did not prove to be very exact that is why average of the two measurements for each picture was taken. The objective analysis does not take into account other personal traits and features similarly as was explained above for Golden Ratio Face. The acquired results of the executives were compared to find if they are significantly different from each other. After the average of the two results was calculated. For further research it would be better to take as many measurements as possible for higher reliability.

3.c. Student survey

From the early age as infants, we can evaluate the beauty of a person. (Langlois, Roggman, Casey, Ritter & et al, 1987). Therefore this paper will also use student appraisers to judge attractiveness of the executives. To get as many respondents as possible I used help of my thesis supervisor professor Willem Verbeke who distributed the survey among his students or made the survey part of their course assignments. For that I am very grateful and as a result we have been able to collect 606 unique student responses, all between the age of 18 and 25 have. 322 of the study participants were female and 284 were male. The students judged 24 pairs of managers, consisting every time of one higher and one lower executive, to confirm or disconfirm the hypothesis, which suggests that the higher managers should be perceived as more beautiful. The pairs were created in a way so the bias caused by different gender, facial expression or age would be eliminated. In other words people with similar features for instance use of glasses, skin color or weight were put next to each other. Another aspect, which was taken into consideration is cultural background to control for appraisers preferences on beauty, which could also bias the results. In terms of quality, pictures with the same background, lighting and level of professionalism were matched where possible. If the qualities did not match, a quality of one image was decreased to level the quality of the other picture.

All of this restrictions should help to avoid bias cause by different personal preferences of appraisers with regard to personal traits or quality of the pictures. In the questionnaire there are 8 female pairs and 16 male pairs. The order of pairs and order of pictures inside each pair were chosen randomly by throwing two balls to my dog. One ball represented a higher executive and the other ball represented a lower executive. The ball which was the dog brought to me first decided who will be first in the pair. The randomness in the pairs helped to make sure that appraisers did not know, which person is higher or lower in the selection.

To get as many respondents as possible I used help of my thesis supervisor professor Willem Verbeke who distributed the survey among his students or made the survey part of their course assignments. For that purpose there were two version created, one printed out on paper and on online using Surveymonkey.com. It is a nice and simple tool, which fulfilled all the needs of this research. Questions were made compulsory to not have any missing data and once a respondent moved to next page there was no way to go back to control for any changes made after the first

selection. At the end of the survey we asked for basic demographics like age and gender. Gender of the respondents was the most important basis for a segmentation since the third hypothesis is based on it. The appraisers were students and a majority was from Erasmus University Rotterdam. The sample included international students as well, but the majority was Dutch. Therefore the conclusion should be mainly interpreted and valid for The Netherlands.

In each of the 24 comparison pairs, consisting of one high and one low executive every time, the appraisers have to choose on the Likert scale (1 to 7) what score will they assign to each picture. This gives us an ordinal variables as a person can be scored as more attractive than other and ordered by a rank. The gender of respondents was coded 0 for males and 1 for females as a nominal variable. The age of respondents was coded as a ratio variable. The 24 pairs were tested using repeated measures ANOVA method in statistical software from IBM called SPSS.

ANOVA with repeated measures uses the same subjects measured more times. For instance, repeated measurements are usually collected through out a longer period in a longitudinal study where a change over time is recorded. Other studies, which use non-repeated method, to compare the same measure in several different conditions. For example, when testing the effects of guarana on cognitive function, a person's calculation ability might be measured once when he is given placebo and once with a real dose.

Before using the model for analysis, specific assumptions need to be checked. Not meeting the assumptions could result into results containing an error. With the repeated measures ANOVA, number of univariate and multivariate requirements have to be met. The univariate assumptions:

- Normality - dependent variable has to have a normal distribution for every level of the within-subjects factor
- Sphericity - Difference scores calculated between two within-subjects factor levels has to have the equal variance if comparing any two levels. Applicable only if the independent variable has more than two levels
- Randomness - the sample should be random and scores of different participants have to be independent.

The multivariate assumptions:

- Multivariate normality - The different scores must have multivariate normal distribution in the population.
- Randomness - the sample should be random and scores of different participants have to be independent.

In the end the results three data sets are compared. The objective beauty score from Golden Ratio Face and nFace of each executive in the 24 questions is examined. The subjective beauty survey is analyzed using the ANOVA and subsequently compared to results from the apps. If the results would be in showing the same outcome with comparable insights that would give validity to the correlation.

4. Findings

In this section I will provide results of all the analysis performed on the three different datasets. Statistical tool IBM SPSS will be used for analysis and all of the outcomes will be interpreted and hypothesis will be discussed based on these results as a buildup for a final discussion.

In the logic proposed by the hypothesis development we will start right from the first hypothesis and look at the findings from each separate analysis. The first main hypothesis proposes that there the higher management from top 100 companies should be considered better looking compared to the lower management from bottom 100 companies. The hypothesis was divided into three sub-hypothesis based on three different analysis types, Golden Ratio Face, nFace and student survey, respectively.

4.a. Hypothesis number 1

The averages out of two measurements of the high executives and the low executives were calculated and compared independent sample t-test. The significance of the analysis the is 0.000 what is less than chosen 0.05 threshold, therefore the null hypothesis stating that the measurements are equal is rejected. Apparently there is a difference in attractiveness of top management between the highest and the lowest companies of the Fortune 1000 list. For the research that is a first positive result of the analysis. The difference between the groups expressed in score is 0.072917 by the analysis of Golden Ratio Face, which mean that the higher executive are better looking indeed and the Hypothesis 1a is confirmed.

For the nFace the process was repeated. The averages out of two measurements of the high executives and the low executives were calculated and compared independent sample t-test. The significance of the analysis the is 0.025 what is less than chosen 0.05 threshold, therefore the null hypothesis stating that the measurements are equal is rejected. Apparently there is a difference in attractiveness of top management between the highest and the lowest companies of the Fortune 1000 list. That makes a second positive outcome in line with the theory of the paper in a row. What is less satisfactory is the direction of the difference. The difference between the groups expressed in score is 0.44167 by the analysis of nFace, it would be nicer if the lower executives were not quantified as better looking, but the result is valid and the Hypothesis 1b is rejected.

Next step is analysis of student survey data using repeated measures ANOVA and confirming or disconfirming the third sub-hypothesis 1c. The significance of the analysis the is 0.000 what is less than chosen 0.05 threshold, therefore the null hypothesis stating that the measurements are equal is rejected. Judged by students there is a difference in attractiveness of top management between the highest and the lowest companies of the Fortune 1000 list. This is very positive news for the paper since the sample is pretty robust containing 606 respondents. The difference between the groups mean expressed in score is 0.249 perceived by the participants and Hypothesis 1c is confirmed.

To conclude the results of the first hypothesis testing, the first hypothesis 1a was confirmed and knowing the precision of Golden Ratio Face this very optimistic start. Unfortunately the second sub-hypothesis examined by nFace was not confirmed. As was mentioned in the methodology

above, nFace is not very reliable tool thus it is not a big disappointment. Finally, the last sub-hypothesis 1c about subjective beauty researched by 606 participants was confirmed, which is very important discovery. In the following section the results of the second hypothesis will be discussed.

4.b. Hypothesis number 2

The hypothesis number 2 states that an objective beauty of women in higher executive positions is higher than the beauty of the men in higher executive positions and the same logic applies to lower executive women versus men, measured both by objective and subjective methods divided into three sub-hypothesis similarly to the first hypothesis starting with Golden Ratio Face, then nFace and student survey as a last one.

The averages out of two measurements of the high women and men executives and the low women and men executives were calculated and compared using independent sample t-test. The significance of the analysis for high women vs high men is 0.000 what is less than chosen 0.05 threshold, therefore the null hypothesis stating that the measurements are equal is rejected. Apparently there is a difference in attractiveness of top management between the highest women and men. The difference between the groups expressed in score is 0.04625 by the analysis of Golden Ratio Face, but in the direction of the high men executives being viewed as more attractive than women. The significance of the analysis for low women vs low men is 0.000 what is less than chosen 0.05 threshold, therefore the null hypothesis stating that the measurements are equal is rejected. The difference between the groups expressed in score is 0.171875 by the analysis of Golden Ratio Face, this time in the expected direction meaning the lower executive women being appraised as better looking. Since only half of the hypothesis was confirmed, the hypothesis 2a is rejected.

The analysis using nFace was done in an exactly same fashion as the one above. The significance of the analysis for high women vs high men is 0.005 what is less than chosen 0.05 threshold, therefore the null hypothesis stating that the measurements are equal is rejected. The difference between the groups expressed in score is 0.625 by the analysis of nFace, in the right direction meaning the women from higher management are indeed better looking than men in higher

positions. The significance of the analysis for low women vs low men is 0.01 what is less than chosen 0.05 threshold, therefore the null hypothesis stating that the measurements are equal is rejected. The difference between the groups expressed in score is 0.3375 by the analysis of Golden Ratio Face, but a favor of lower executive men, yielding exactly opposite outcomes as Golden Ratio Face. The hypothesis 2b is rejected as well.

The last step is analysis of student survey data using repeated measures ANOVA and confirming or disconfirming the third sub-hypothesis 2c. The significance of the analysis the is 0.000 what is less than chosen 0.05 threshold, therefore the null hypothesis stating that the measurements are equal is rejected. The difference between the groups expressed in score is 0.675 by the analysis of the survey, in the right direction meaning the women from higher management are indeed better looking than men in higher positions. The significance of the analysis for low women vs low men is 0.00 what is less than chosen 0.05 threshold, therefore the null hypothesis stating that the measurements are equal is rejected. The difference between the groups expressed in score is 0.421 and also in the wanted direction meaning both parts of the sub-hypothesis 2c were confirmed and thus the hypothesis is confirmed.

To conclude the results of the second hypothesis, the first of three, hypothesis 2a was tested by Golden Ratio Face and the second hypothesis 2b was tested by nFace. The apps showed completely inverted results when a different part was confirmed and different part was declined thus both of the hypothesis were refused in the end. The only optimistic result of the second hypothesis came from the last sub-hypothesis 2c. The subjective beauty researched by 606 participants was confirmed, which is very important discovery. It was found that the executive women in general are better looking than the executive men. In the following section the results of the third hypothesis will be discussed.

4.c. Hypothesis number 3

Hypothesis number 3 states that women and man use slightly different approach to appraise beauty, therefore I expect them to assign different attractiveness scores to people. To research this assumption I will use IBM SPSS statistical program. The method used will be repeated measures ANOVA where I will look for an interaction effect between the gender of an appraiser

and the score given to the executives. Interaction for age will be also tested, but since my sample contains only young people between 18 and 25 years old, a big differences in judgment are not expected. The result of an analysis is provided here:

Tests of Within-Subjects Effects

Measure: MEASURE_1

Source		Type III Sum of Squares	df	Mean Square	F	Sig.	Partial Eta Squared
highlow	Sphericity Assumed	16,230	1	16,230	636,772	,000	,519
	Greenhouse-Geisser	16,230	1,000	16,230	636,772	,000	,519
	Huynh-Feldt	16,230	1,000	16,230	636,772	,000	,519
	Lower-bound	16,230	1,000	16,230	636,772	,000	,519
highlow * Gender	Sphericity Assumed	,142	1	,142	5,591	,018	,009
	Greenhouse-Geisser	,142	1,000	,142	5,591	,018	,009
	Huynh-Feldt	,142	1,000	,142	5,591	,018	,009
	Lower-bound	,142	1,000	,142	5,591	,018	,009
highlow * Age	Sphericity Assumed	,191	7	,027	1,071	,380	,013
	Greenhouse-Geisser	,191	7,000	,027	1,071	,380	,013
	Huynh-Feldt	,191	7,000	,027	1,071	,380	,013
	Lower-bound	,191	7,000	,027	1,071	,380	,013
highlow * Gender * Age	Sphericity Assumed	,205	7	,029	1,148	,331	,013
	Greenhouse-Geisser	,205	7,000	,029	1,148	,331	,013
	Huynh-Feldt	,205	7,000	,029	1,148	,331	,013
	Lower-bound	,205	7,000	,029	1,148	,331	,013
Error(highlow)	Sphericity Assumed	15,038	590	,025			
	Greenhouse-Geisser	15,038	590,000	,025			
	Huynh-Feldt	15,038	590,000	,025			
	Lower-bound	15,038	590,000	,025			

Table 1: results of repeated measures ANOVA using high and low executives with interactions.

As we can see in the results gender of participants in the study makes a difference when judging the beauty of the 48 executives. It is significant at 5% level. To provide more information about the difference in judgement we can have a look at following tables:

Estimates

Measure: MEASURE_1

Gender	Mean	Std. Error	95% Confidence Interval	
			Lower Bound	Upper Bound
Female	3,706	,036	3,636	3,777
Male	3,577	,039	3,500	3,653

Table 2: Estimated marginal means for gender.

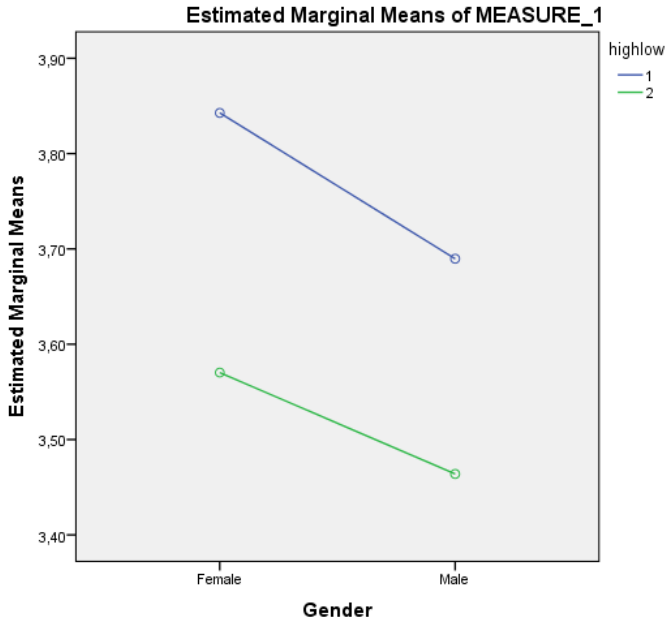
Univariate Tests

Measure: MEASURE_1

	Sum of Squares	df	Mean Square	F	Sig.	Partial Eta Squared
Contrast	2,199	1	2,199	5,960	,015	,010
Error	217,734	590	,369			

Table 3: The F tests the effect of Gender. This test is based on the linearly independent pairwise comparisons among the estimated marginal means.

The significance of the analysis is 0.015 what is less than 0.05, therefore the null hypothesis stating that the measurements are equal is rejected. Gender certainly plays a role when assessing attractiveness of other people. The difference between the groups expressed in score is 0.129 by the analysis and it shows that women give higher scores. As an illustration will serve the next picture:



Graph 3: Difference between female and male appraising of beauty.

To understand the finding even deeper I run several extra ANOVAs to see what could be a decisive factor for different appraising. The analysis were constructed in the similar manner as previous main analysis. Between the compared pairs were these combinations High men vs Low men (see Table 4 in the Appendix), High women versus Low women (see Table 5), High men versus High women (see Table 6) and Low men vs low women (see Table 7). For some reasons while assign score to men, high men vs low men, the interaction with gender turned out to be insignificant. There was almost none distance (0.048) between the means different genders were giving to the male executives. Meanwhile in all of the other three combinations where there were women executives to be scored, the interaction with gender was significant at 5% level again. It is an interesting phenomenon and we can say that women tend to stick together and give higher scores in general to other women. To sum up, hypothesis number 3 was proven to be right. In the following section I will end the findings part by looking at the last hypothesis, which is hypothesis number 4.

4.d. Hypothesis number 4

Hypothesis number 4 expects that the objective beauty analysis apps, Golden Ratio Face and nFace, and the subjective beauty survey will yield the same results concerning the impact of attractiveness of executives to their professional success.

To conclude the results of the first hypothesis testing, the first hypothesis 1a was confirmed and knowing the precision of Golden Ratio Face this very optimistic start. Unfortunately the second sub-hypothesis examined by nFace was not confirmed. As was mentioned in the methodology above, nFace is not very reliable tool thus it is not a big disappointment. Finally, the last sub-hypothesis 1c about subjective beauty researched by 606 participants was confirmed, which is very important discovery. Therefore the final fourth hypothesis has to be rejected, because all of the three different datasets did not provide a same analysis outcome, but if I have not have used nFace, which uses very simple and unprofessional analysis, the result might be very optimistic. If we discuss second research question with regard to comparison all of the three databases and drawing the same conclusion, it was much worse than in the first case. Golden Ratio Face and

nFace yielded contradictory outcomes and survey was not in line with any of them. Since the second hypothesis was not connected to the main topic of this paper this is not a big problem.

5. Conclusion and discussion

The literature review section of this paper researches studies that argue for several direct or indirect benefits of attractiveness. Being attractive influences all the aspects of our lives. In professional life the road to success might be easier, the attractive people can get higher salaries, get a higher loan or be perceived as being more capable. From personal point of view they are perceived to carry many positive traits like higher intelligence, better mentality, stronger personality, loyalty or being happy just for their appearance. In social life they are believed to possess superior social skills, they have bigger social influence, are better treated by others, get more attention easily, they are positively discriminated by teachers and people are more willing to open to them. Another area of advantage is mate acquisition, where they are seen as healthier, strong and able to provide better offspring. All of this benefits make me believe that there must be a correlation between a level of attractiveness of a person and his professional career success.

Method used to analyze the data consisted of three different pillars. The mobile apps for Android mobile phones, which were used are Golden Ratio Face and nFace. Both of these apps use facial symmetry, facial structure and the golden ratio to calculate so-called objective beauty of people on the pictures. Moreover we used student appraisers to judge subjective attractiveness of the executives. 606 students between the age of 18 and 25, 322 of the study participants were female and 284 were male, have judged 24 pairs, consisting every time of one higher and one lower executive, to confirm or disconfirm the hypothesis, which suggests that the higher managers should be perceived as more beautiful.

To conclude the results of the first hypothesis testing, the first hypothesis 1a was confirmed and knowing the precision of Golden Ratio Face this was a very optimistic start. Unfortunately the second sub-hypothesis examined by nFace was not confirmed. As was mentioned in the methodology already, nFace is not very reliable tool thus it is not a big disappointment. For further research I would advise to use another, more professional tool. Finally, the last sub-

hypothesis 1c about subjective beauty researched by 606 participants was confirmed, which is very important discovery.

The results of the second hypothesis was at follows, the first of three, hypothesis 2a was tested by Golden Ratio Face and the second hypothesis 2b was tested by nFace. The apps showed completely inverted results when a different part was confirmed and different part was declined thus both of the hypothesis were refused in the end. The only optimistic result of the second hypothesis came from the last sub-hypothesis 2c. The subjective beauty researched by 606 participants was confirmed, which is very important discovery. It was found that the executive women in general are better looking than the executive men. Since the differences between means of scores were really small and results were mixed we can safely conclude that case about women being perceived as more beautiful in general was rejected.

The third hypothesis was successful and confirmed the assumption about sexes judging beauty differently. To understand the finding from the third hypothesis analysis even deeper I run several extra ANOVAs to see what could be a decisive factor for different appraising. For some reasons while assign score to men, high men vs low men, the interaction with gender turned out to be insignificant. There was almost none distance (0.048) between the means different genders were giving to the male executives. Meanwhile in all of the other three combinations (high vs low women, high men vs high women and low men vs low women) where there were women executives to be scored, the interaction with gender was significant at 5% level again. It is an interesting phenomenon and we can say that women tend to stick together and give higher scores in general to other women compared to men. The reasons for that are a mystery. Probable explanations could be that women are very good at judging beauty in general, since they are more detail oriented and compete with other women in attractiveness, which makes them more critical at the same time, but being able to appreciate and recognize it better in the end. To sum up, hypothesis number 3 was proven to be right.

Results of the first hypothesis and all the sub-hypothesis were discussed above already. From the results it is obvious that the final fourth hypothesis has to be rejected, because all of the three different datasets did not provide a same analysis outcome, but if I have not have used nFace, which uses very simple and unprofessional analysis, the result might be very optimistic. On the

other hand, Golden Ratio Face proved to be were exact measurement tool and I would advise to use it for measuring objective attractiveness of people. If we discuss second research question with regard to comparison all of the three databases and drawing the same conclusion, it was much worse than in the first case. Golden Ratio Face and nFace yielded contradictory outcomes and survey was not in line with any of them. Since the second hypothesis was not connected to the main topic of this paper this is not a big problem.

If I would have to choose an ideology, which would explain failure to prove the main hypothesis of the paper I would bet my money on researchers stating that quality of genes is too broad a concept consisting of many elements and to generalize it just to a facial beauty is a major simplification. Between other important indicators is parental care, health, fertility, intelligence, immunity, good genes or epigenetics which have to be taken into account. More focused and deeper research strategies are needed to examine true discriminators of good genes and its relationship with facial beauty. Chances are that the topic is more complex than proposed in this paper and to look for direct correlation between ones professional success and looks might be a too big of a stretch.

Nevertheless being attractive certainly have lot of positives and advantages. Even if a beautiful will not be probably enough to have a successful career. In the end I would like to mention several negatives of beauty as well for people who have not been that lucky in order to to not lose hope. Better looking people might be confused if other people like them for who they are or only because of their looks. Some studies found a correlation between being attractive and not being honest or caring for other people. Attractive people might realize what their strength is and become over dependent on their looks. Other people tend to associate some of the less favorable traits with beautiful individuals like egocentrism or vanity and likely to think of them as manipulative or shallow. It happens often that beautiful people might find hard to connect with some people or make friends because of their jealousy towards them. Long story short, being good-looking is not everything.

I would like to close by looking at market relevance of this paper. In the introduction I argued for several possible advertisements based on relationship between beauty and professional career success. Since the main hypothesis was not confirmed and the results were not constant over the three datasets I will not discuss this topic further. What was confirmed and is more relevant to

discuss is understanding which target groups perceive beauty more sensitively than others, or which appraisers are more critical. Hypothesis number 3 was confirmed meaning that men and women perceive beauty differently. That allows for ads more suitable for a target audience, based on its perception of beauty or sensitiveness to it. Based on the theory discussed it could be explained by findings about women being more detail oriented, while men are more focused on the whole picture. Women appraising beauty use more brain parts, thus their assessment of attractiveness seems to be more complex and an ad should be worked through to every last detail. Meanwhile ads targeting men should have clearer frame highlighting the most important information of the advertisement. This particular finding could add value to targeting in marketing.

6. Limitations and further research

From the results it is obvious that the final fourth hypothesis has to be rejected, because all of the three different datasets did not provide a same analysis outcome, but if I have not have used nFace, which uses very simple and unprofessional analysis, the result might be very optimistic. On the other hand, Golden Ratio Face proved to be were exact measurement tool and I would advise to use it for measuring objective attractiveness of people. It is important to mention here that in this analysis, all of the results in the analysis were very close in absolute numbers, while measuring high vs low, men vs women and so on, which could mean that there is not a big difference in beauty between different categories I created for this research.

Several shortcomings in the study should be addressed. The appraised pictures were not completely the same, there were differences in a facial expressions, if a person wore a make-up, rotation of a face or a quality of the photos was also not the same throughout all of the companies. There is some research done into female hormonal cycle and its effects on appraising masculinity in male faces, which was also not controlled for. Also the use of the golden ratio as the main method to appraise objective beauty could be doubted. This method based on Marquardt's mask was criticized for favoring European populations and not being suitable for other races. More research should provide new insights into validity and range of application of

Marquardt's mask and similar techniques for assessing facial attractiveness and its connection to subjective beauty.

The applications used do not include assessment of facial traits and image characteristics that build up a complete picture of attractiveness and does not control facial features, which could have an impact on the score. If someone is not looking directly forward, have a moustache, is older, is bold or wears a moustache, all of these factors can alternate a result. Another aspects that might change an outcome are connected to the quality of a picture like a degree of professionalism, lighting and resolution. These factors provide an extra reason to compare several sources of data and methods of analysis. Results of Golden Ratio app will be first compared with nFace results, which uses similar form of measurement and subsequently compared with the student survey results. If the result of all of the three data sets would be in line that would increase the probability of existence of the correlation I am trying to find. Even if the traits and features matter in an attractiveness score, the subjective beauty judged by people will account for this, since people notice these differences and that way the traits will find their way into the final result. To research deeper this details is beyond the scope of my topic, but might be an interesting idea for future research.

Another important reality to acknowledge is that we are talking just about correlation and not causality. Therefore we cannot say that being beautiful will make you successful, it might be the other way around. The level of attractiveness could be just a moderator or a mediator and the real reason could be hidden somewhere deeper. What if being successful makes people more confident and more attractive to other people in return. It could be easily the case, since many people tend to acquire a big deal of confidence after having some success in professional life, climbing higher the social ladder or acquiring social status. In this paper I take into account subjective and objective beauty to find an outcome explaining the most of the relationship, but one variable could be still missing and that is how the person perceives himself. From my personal experience I can say that there is lot of ugly confident people and lot of beautiful people, which are not confident at all. If the person likes himself and feels good about him, he should be perceived as more beautiful by others because of the confidence or more mysterious terms as character, energy and most importantly should think he is better looking. Another explanation could be that even personal success affects professional life. People who acquired mate they are

proud of or have satisfactory family life might be happier and in result more confident and seen as more beautiful by others. Maybe everything is much simpler and the more successful the company is the more professional demands are put on its employees with regard to clothing, style or taking care about the appearance in general. Since top companies care more about the look, they might also higher more professional photographer for taking the company pictures. People are the face of the company after all.

For further research it would be interesting to use fMRI-based technics and other new neuroscience methods to identify neural networks responsible for beauty appraising and how they work. It would be interesting to see if for example male appraises another male or a female and vice versa, similarly to what we argue in the third hypothesis. It has to be mentioned that my research measured objective beauty by using the Marquardt's mask in the Golden Ratio Face app, which might be the most known method, but it would be interesting to add more variables, which definitely have impact on overall beauty of a person. Between the measurements we could include color a skin, body smell, bone structure, waist-to-chest ratio in men, hair, musculature, genitalia, height, body mass, buttocks, breasts, waist-to-hip ratio in women, skin condition, height, hair or leg-to-body ratio in women.

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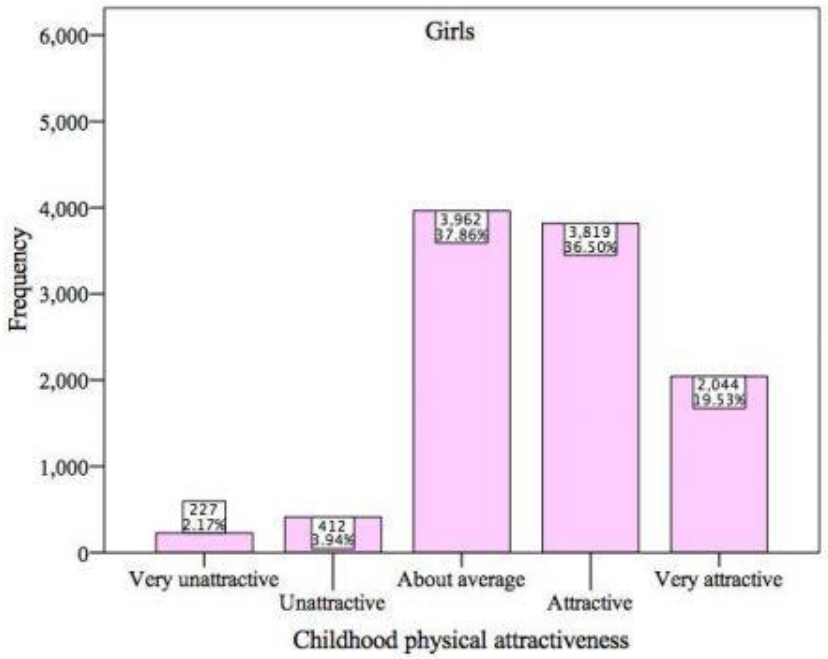
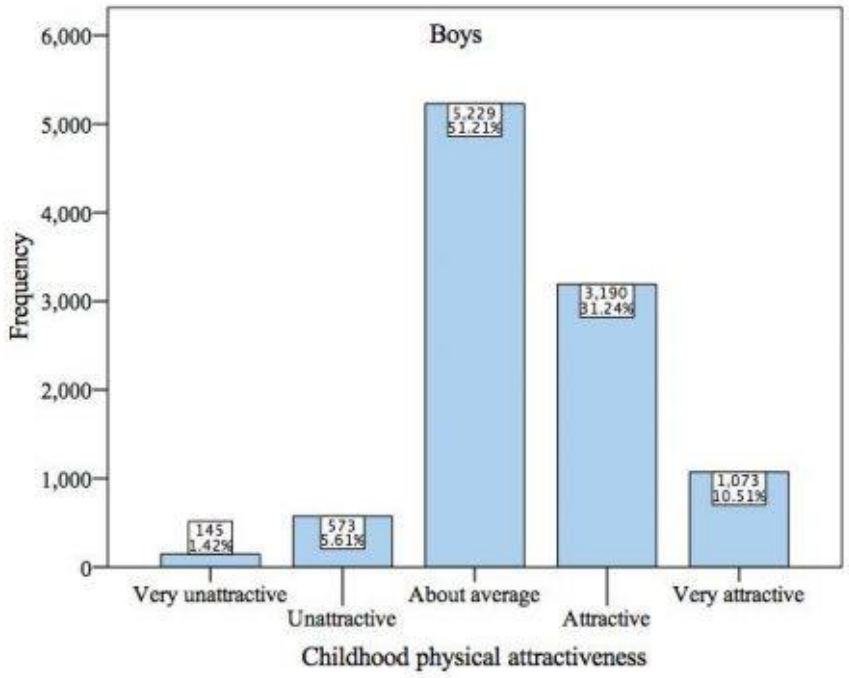
8. Appendix

Graph 1



Graph 2



Source: https://www.psychologytoday.com/blog/the-scientific-fundamentalist/201101/women-are-more-beautiful-men

Table 4: High men vs low men

Multivariate Tests[a]

Effect		Value	F	Hypothesis df	Error df	Sig.	Partial Eta Squared
highlow_men	Pillai's Trace	,303	255,979[b]	1,000	590,000	,000	,303
	Wilks' Lambda	,697	255,979[b]	1,000	590,000	,000	,303
	Hotelling's Trace	,434	255,979[b]	1,000	590,000	,000	,303
	Roy's Largest Root	,434	255,979[b]	1,000	590,000	,000	,303
highlow_men * Gender	Pillai's Trace	,005	3,101[b]	1,000	590,000	,079	,005
	Wilks' Lambda	,995	3,101[b]	1,000	590,000	,079	,005
	Hotelling's Trace	,005	3,101[b]	1,000	590,000	,079	,005
	Roy's Largest Root	,005	3,101[b]	1,000	590,000	,079	,005
highlow_men * Age	Pillai's Trace	,014	1,166[b]	7,000	590,000	,320	,014
	Wilks' Lambda	,986	1,166[b]	7,000	590,000	,320	,014
	Hotelling's Trace	,014	1,166[b]	7,000	590,000	,320	,014
	Roy's Largest Root	,014	1,166[b]	7,000	590,000	,320	,014
highlow_men * Gender * Age	Pillai's Trace	,018	1,505[b]	7,000	590,000	,163	,018
	Wilks' Lambda	,982	1,505[b]	7,000	590,000	,163	,018
	Hotelling's Trace	,018	1,505[b]	7,000	590,000	,163	,018
	Roy's Largest Root	,018	1,505[b]	7,000	590,000	,163	,018

a. Design: Intercept + Gender + Age + Gender * Age

Within Subjects Design: highlow_men

b. Exact statistic

Table 5: High women vs low women

Multivariate Tests[a]

Effect		Value	F	Hypothesis df	Error df	Sig.	Partial Eta Squared
highlow_women	Pillai's Trace	,476	534,935[b]	1,000	590,000	,000	,476
	Wilks' Lambda	,524	534,935[b]	1,000	590,000	,000	,476
	Hotelling's Trace	,907	534,935[b]	1,000	590,000	,000	,476
	Roy's Largest Root	,907	534,935[b]	1,000	590,000	,000	,476
highlow_women * Gender	Pillai's Trace	,011	6,819[b]	1,000	590,000	,009	,011
	Wilks' Lambda	,989	6,819[b]	1,000	590,000	,009	,011
	Hotelling's Trace	,012	6,819[b]	1,000	590,000	,009	,011
	Roy's Largest Root	,012	6,819[b]	1,000	590,000	,009	,011
highlow_women * Age	Pillai's Trace	,016	1,362[b]	7,000	590,000	,219	,016
	Wilks' Lambda	,984	1,362[b]	7,000	590,000	,219	,016
	Hotelling's Trace	,016	1,362[b]	7,000	590,000	,219	,016
	Roy's Largest Root	,016	1,362[b]	7,000	590,000	,219	,016
highlow_women * Gender * Age	Pillai's Trace	,010	,844[b]	7,000	590,000	,551	,010
	Wilks' Lambda	,990	,844[b]	7,000	590,000	,551	,010
	Hotelling's Trace	,010	,844[b]	7,000	590,000	,551	,010
	Roy's Largest Root	,010	,844[b]	7,000	590,000	,551	,010

a. Design: Intercept + Gender + Age + Gender * Age
Within Subjects Design: highlow_women

b. Exact statistic

Table 6: High men vs high women

Multivariate Tests[a]

Effect		Value	F	Hypothesis df	Error df	Sig.
factor1	Pillai's Trace	,573	791,171[b]	1,000	590,000	,000
	Wilks' Lambda	,427	791,171[b]	1,000	590,000	,000
	Hotelling's Trace	1,341	791,171[b]	1,000	590,000	,000
	Roy's Largest Root	1,341	791,171[b]	1,000	590,000	,000
factor1 * Age	Pillai's Trace	,010	,862[b]	7,000	590,000	,537
	Wilks' Lambda	,990	,862[b]	7,000	590,000	,537
	Hotelling's Trace	,010	,862[b]	7,000	590,000	,537
	Roy's Largest Root	,010	,862[b]	7,000	590,000	,537
factor1 * Gender	Pillai's Trace	,052	32,224[b]	1,000	590,000	,000
	Wilks' Lambda	,948	32,224[b]	1,000	590,000	,000
	Hotelling's Trace	,055	32,224[b]	1,000	590,000	,000
	Roy's Largest Root	,055	32,224[b]	1,000	590,000	,000
factor1 * Age * Gender	Pillai's Trace	,010	,892[b]	7,000	590,000	,512
	Wilks' Lambda	,990	,892[b]	7,000	590,000	,512
	Hotelling's Trace	,011	,892[b]	7,000	590,000	,512
	Roy's Largest Root	,011	,892[b]	7,000	590,000	,512

a. Design: Intercept + Age + Gender + Age * Gender

Within Subjects Design: factor1

b. Exact statistic

Table 7: Low men vs low women

Multivariate Tests[a]

Effect		Value	F	Hypothesis df	Error df	Sig.
lowmanvswoman	Pillai's Trace	,433	450,767[b]	1,000	590,000	,000
	Wilks' Lambda	,567	450,767[b]	1,000	590,000	,000
	Hotelling's Trace	,764	450,767[b]	1,000	590,000	,000
	Roy's Largest Root	,764	450,767[b]	1,000	590,000	,000
lowmanvswoman * Age	Pillai's Trace	,014	1,236[b]	7,000	590,000	,281
	Wilks' Lambda	,986	1,236[b]	7,000	590,000	,281
	Hotelling's Trace	,015	1,236[b]	7,000	590,000	,281
	Roy's Largest Root	,015	1,236[b]	7,000	590,000	,281
lowmanvswoman * Gender	Pillai's Trace	,047	29,168[b]	1,000	590,000	,000
	Wilks' Lambda	,953	29,168[b]	1,000	590,000	,000
	Hotelling's Trace	,049	29,168[b]	1,000	590,000	,000
	Roy's Largest Root	,049	29,168[b]	1,000	590,000	,000
lowmanvswoman * Age * Gender	Pillai's Trace	,006	,488[b]	7,000	590,000	,844
	Wilks' Lambda	,994	,488[b]	7,000	590,000	,844
	Hotelling's Trace	,006	,488[b]	7,000	590,000	,844
	Roy's Largest Root	,006	,488[b]	7,000	590,000	,844

a. Design: Intercept + Age + Gender + Age * Gender

Within Subjects Design: lowmanvswoman

b. Exact statistic