HUMAN NOSE SHAPES

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INTRODUCTION

A classification for nose shape has been developed. It is the first comprehensive classification to assess nose shape. Previous classifications for nose traits have lacked scientific rigor with preconceived ideas and selected population groups or photographs. The sample population of children who took part in the scan process can be considered to be representative of 15-year-old British children. The gender distribution of this particular research study has equal number of male and female children. The sampling distribution of this particular research study is unbiased. The sample determinates compare favorably with research that had previously been conducted into the issue of facial variation, whether these related to UK children of those from other ethnic origins (Toma et al 2008, p. 180). Akinbami & Kenneth (2002) for example, only included a sample of 1,470 subjects in a study that included a number of ethnic groups or races. Furthermore, the latest study conducted by previous researchers related to Caucasian and consisted of a subject cohort totaling 1,793.

Similarly, in addition to the size of the cohort, the use of 3D imaging software for the purpose of completing the scanning process has proven to be reliable and accurate when used within a range of studies related to facial variations. With use of this element as part of the methodological approach adopted for this study, the findings can be deemed to have eliminated "projection problems commonly found in radiography and photographs" (Toma et al 2011, p. 33), which is the 2D approach that was, of necessity, adopted for a number of earlier studies. This applies in relation to both landmark dimensions and classifications used and the time scale during which the scanning

process took place. Despite the fact that some studies have highlighted disadvantages in 3D imaging, the consensus appears to confirm its relevance to assessing facial variations. This consensus of accuracy has also been noted when 3D imaging models have been applied in other areas of health care, such as dentistry and disease recognition, and even with other facial features like the human ear.

It has been noted from a search of the literature that there have been relatively few studies that focused upon assessing variation in the nose shape apart from the "longitudinal study of the growth of the nose" research conducted by Akinbami & Kenneth (2002) and these studies sought to associate nose shapes with psychological determinants. However, these studies did not have the advantage of the high level of 3D imaging and scanning software that has developed over the past four decades. More recently, a research study is conducted that was similar to the current study, in that it focused upon nose variations in relation to age and gender. The research of these authors focused on a sample of 519 male and 340 female healthy subjects aged 4-73 years. The findings of this research study indicated that variance has been found in asthmatic patients because of nostrils. Krey & Dannhauer (2008) took a similar approach in their research by including adults as well as children. The findings of their research study suggest that patients are facing variation because of nose reconstruction. Similarly, a recent survey conducted by Toma et al. (2011) focused predominantly upon an adult sample population. The disadvantage of these researchers is that a large percentage of subjects being assessed would have nose shapes that would have completed the growth process.

In this study, a 15 parameter category was developed as a classification of nose shapes based on facial orientation and definitions. The 15 parameters included the following: nose shape, deviation, ridge width, nostril show, ala shape (frontal view), tip shape (bottom view), notch, nostril difference, bridge protrusion, ridge shape (profile), tip shape (profile), columella, columella insertion, ala shape (profile) and maturity. This kind of categorization was very reliable as the inter- and intra-examiner agreement among subjects examined for most of the categories was greater than 80%. The notch category had a 100% agreement between two examiners indicating that it was the easiest to categorize. This classification is far more detailed, compared to that of the well known Eden Warwick's Nasology that categorizes the nose based on its characteristics, almost similar to phrenology. This is only a 6-type classification: the Roman nose, the Greek nose, the African nose, the Hawk nose, the Snub nose, and the Celestial nose (Warwick 2009). However, in the Journal of Craniofacial Surgery, professor Abraham Tamir was able to classify different shapes of noses from 1300 photographs of people he had taken in Europe and Israel into 14 categories: Snub, Duchess, Nixon, Fleshy, Hawk, Mirren, Greek, Aquiline, Roman, Rumpole, Celestial, Lenin, Redknapp, and, finally, the Tara (Tamir 2011, p. 1104). He was also able to match each nose shape with a character trait and even went ahead to match each nose shape with a famous person. According to Dr. Tony Youn, a Michigan-based board-certified plastic surgeon, there was a major limitation in professor Tamir s research work: he only categorized Caucasian noses. He did not classify Latino noses, African noses, Asian noses, other non-Israeli, and non-European nose types (Nierenberg 2011).

result of achieving different stages of facial growth due to pubertal changes, which may mask any underlying condition effect. It will be apparent from the test process that, of the random sample selected the notch and the nostril difference were the most reliable categories while the nose and the tip shapes were the least in reliability. However, in all of the other categories it is apparent that the degree of consistency generally supports the reliability and validity of the research as a whole.

ANALYSIS OF THE RESULTS

The findings of this research study indicated that differences in relation to the percentage of subjects were because of the most balanced percentages. The Findings of this study indicate that maturity category was 77%, which was followed by ridge width (65.2%), nostril show (61%) and deviation (60.5%). The high amount of variation among the scores was recorded because of nose general shape and nose tip shape, where a percentage of subjects fell within all areas of the score system. The category of nose tip was the one which indicated the highest level of variation. Krey & Dannhauer (2008), using a similar three-dimensional approach, concluded that there was a relationship between these particular soft tissue categories and the hard dimensions of the nose shape. The findings indicate that nostril difference and the columella are the three categories where the variation from the most balanced score can be determined as those which indicate the most even spread across the genders. Professor Tamir s study was qualitative and he assessed the distribution of the different Caucasian nose shapes in Europe. His results were based on 1793 pictures of noses, of which

403 were artworks, 498 were photographs taken by the author in European countries like Holland, Belgium, and France , 801 were photographed in Israel, and 91 are not clear where exactly they were photographed. 1081 were photographs of men, and 712 were of women. The author has succeeded in classifying all the noses into 14 groups, where for each nose shape it was possible to find a visual demonstration. He also found out that the most prevalent nose shape was the fleshy nose, especially seen in men. Moreover, this nose shape occurred in a quarter of the faces that were studied by Professor Tamir. The least prevalent nose shape was the Greek, at 3% (Macrae, 2011). As a follow up study, Tamir conducted a quantitative survey on the same shape of nose for women and men. They presented a quantitative difference for the same nose shape in men and women (Tamir, 2012).

RELEVANCE OF THE STUDY

Both independently, as a part of the wider use of three-dimensional studies in the growth and change of facial features, the findings of the current study, and its assessment of nose shape variation, is of relevance in a number of research areas, as well as having more practical relevancies. From a technological aspect, it contributes to the determination of facial recognition. In the practical environment, it can assist in the development of technology that is likely to use recognition software as a process of identification, thereby enhancing security systems. Furthermore, as Ham & Lara (2000), have shown in their study, it can also be of benefit in the advancement of forensic science. Specifically, the research conducted by these authors' has shown that, by focusing upon an examination of

facial dimensions, including the nose, which either have changed during a significant period of time, or where changes can be attributed to age related data, these assessment can form part of the criminal detection process. For example, if presented with a „cold case which, despite photographic evidence at the time of the criminal act, has not been solved, the three dimensional nose shape assessment process can prove useful in determining how the appearance of the perpetrator may have altered during the intervening years.

From a medical and health care standpoint, which is one of the most important aspects for the research, it has long been recognized that there are a number of benefits to be gained by studying and assessing changes in nose dimensions and growth. From a research aspect the three dimensional approach of nose shape and change can be used for research purposes in order to assess whether there exists a relationship or correlation between these dimensions. For example, such a relationship could include the correlation of nose dimensions to the prevalence of respiratory issues and, therefore help to identify whether it is possible through health care intervention, such as surgical shape change, to relieve these issues. Hennessy et al (2010) have also conducted a study where they have used three-dimensional imagery and morphometics, particularly front nasal dysmorphology, for the specific purpose of examining whether there is a connection between these dimensions and psychological conditions such as bipolar and schizophrenia. Moreover as noted from Toma's (2011) study, endeavors are also being made to classify nose shape with other psychological and emotional determinants. This shows the 3D processes can be successful in terms of investigating non-physical conditions related

project implementation because they are directly involved in daily operations of software project delivery and thus, participate in the communication process irrespective of the communication form used. The questions were open ended because open-ended questions because the research serves to find full, meaningful answers using the knowledge of the subject/participant.

This study uses purposive sampling in the sense that it will be a judgmental sample because it will be based on the knowledge of the population and the purpose of the research. A representative sample was collected depending on employee responsibility in projects and managerial importance and involvement in project management. Tφlation from which primary data was taken in this study was from the IT department mainly dealing with SW project work and delivery.

Moreover, the three dimensional approach will prove useful in indentifying the changed dimensions of the nose as a result of surgery. Whether such surgery is required as a result of an accident or purely for cosmetic purposes, using a photograph and three dimensional scanning processes, the person responsible for performing the reconstruction is likely to be in a better position to be able to judge how the changes to be made will be likely to affect the persons appearance. Furthermore, the assessment will also enable them to ensure that the variation to the nose will remain in balance with the dimensions of the rest of the person's head and other facial features.

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