

# Why the law of averages should not be used in dentistry



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## ABSTRACT

The statistical method is used in all scientific endeavour including dentistry. All data collected in any study is subjected to a variety of statistical formula to ascertain the significance of the data collected. The most basic of statistical formula's is the average value of a group of scores for any given parameter. It is also the most easily calculated value. Very routinely it is considered that the average value is the correct value for all individuals. This probably is a kind of a cover up of the inability to completely understand and recognize each patients individual needs and a probable lack of rules for individuality. The same applies in dentistry and averages are used to define and describe and design dental prosthesis as well as aesthetics. This review article show how accepting an average is not the best way to go plan and design dental therapy and what is the alternative which should be ideally used.

**KEYWORDS:** Smile design, smylist®, facial, midline, aesthetic, design, software, face analysis, parameters, face, geometry, wrinkles, folds, average

## INTRODUCTION

The mathematical area of statistics is one of the most fundamental basics of human knowledge and is applicable to any and every field of research in the spectrum of information and data collected by mankind. All scientific data and information is always subjected to statistical scrutiny and analyzed thereafter. The most basic statistical computation carried out on any set of data in almost any subject is the calculation of the average value of the dataset. If the subject of study is narrowed down to the medical sciences it becomes very evident that average is always used to find a normal value for the item being studied. An example is the blood pressure of an individual. A BP value of 120/80 is considered to be normal. This value has been generated by conducting a number of studies and measuring the BP value of individuals without symptoms and then calculating the average of the entire data set.

Individuals will vary from this average value but the average is considered to be the norm and if the variation is too far away from the average, it is considered an abnormality. In fact, the objective of all medical therapeutics is usually to get all reports to be as close to the average value as possible. On the flip side medical research is so heavily dependant upon statistics and many a times the statistics itself can read to mean almost anything. Average

proportions for smiles has been fit into the golden proportion with a 1 is to 1.6 ratio and all smiles are by default put into this proportion without considering the individual characteristic of the individual. The same applies to the face, the lips and the entire body. It is very common to read about how statistics can be very far from the truth. It is a common saying that there are only three kinds of lies : lies, damned lies, and statistics. The

average value is very much a part of this statistics.

### STATISTICS IN DENTISTRY

Dentistry, being a science under the medical umbrella almost follows a similar pattern. Most research, studies and available data is collated and put through a statistical process and results are derived. These analysis and averages generated can be of use in demographic data analysis or in community dental research. Dental therapy also tends to rely extensively on average values for smile designing, calculating midlines and vertical dimensions. A common example is the length of the central incisor. Numerous studies over years have provided a lot of data on the size of the central incisor. Using this information, the average length of the crown of the central incisor has been derived. Similarly there have been a number of publications which have arrived at the average vertical dimension of the dentition in centric occlusion.

These values have been suggested as the numbers for dental therapy when restoring teeth or when planning and delivering a full mouth rehabilitation. The averages have been arrived at from data from a large number of individuals. It is not the value with the maximum number of individuals but rather an average value arrived at by using data of all the individual available. This average value is then used to rehabilitate the dentition of all individuals.

individual varies in size and proportion. Application of an average value for rehabilitating the dentition will not be appropriate for the particular individual and hence all numbers related to the new dentition being planned should be specific to the particular individual.

These numbers, in terms of size and shape of teeth, the vertical dimension of the dentition in occlusion and proportion of the teeth to each other has to be custom arrived for each individual on the basis of existent parameters which can be observed on the face extra-orally and in the mouth intra-orally. Smylist® absolutely believes that each individual has specific individual characteristics on the basis of which all of the above has to be calculated. It is only when custom information on all the aspects is used, the dentition will be functionally stable and aesthetically appealing.

Smylist® has clearly defined objective rules for aesthetics which help in accurately planning the dentition for a visually appealing smile and at the same time provides methods to accurately define all the necessary values for ideal function. The treatment plan should encompass all of these values calculated specifically for each individual and not use average values for all patients. Smylist® has created the parallel harmonization method which is a set of rules which defines the ratio and proportion as well as the shape of the canine and the central incisors. These rules

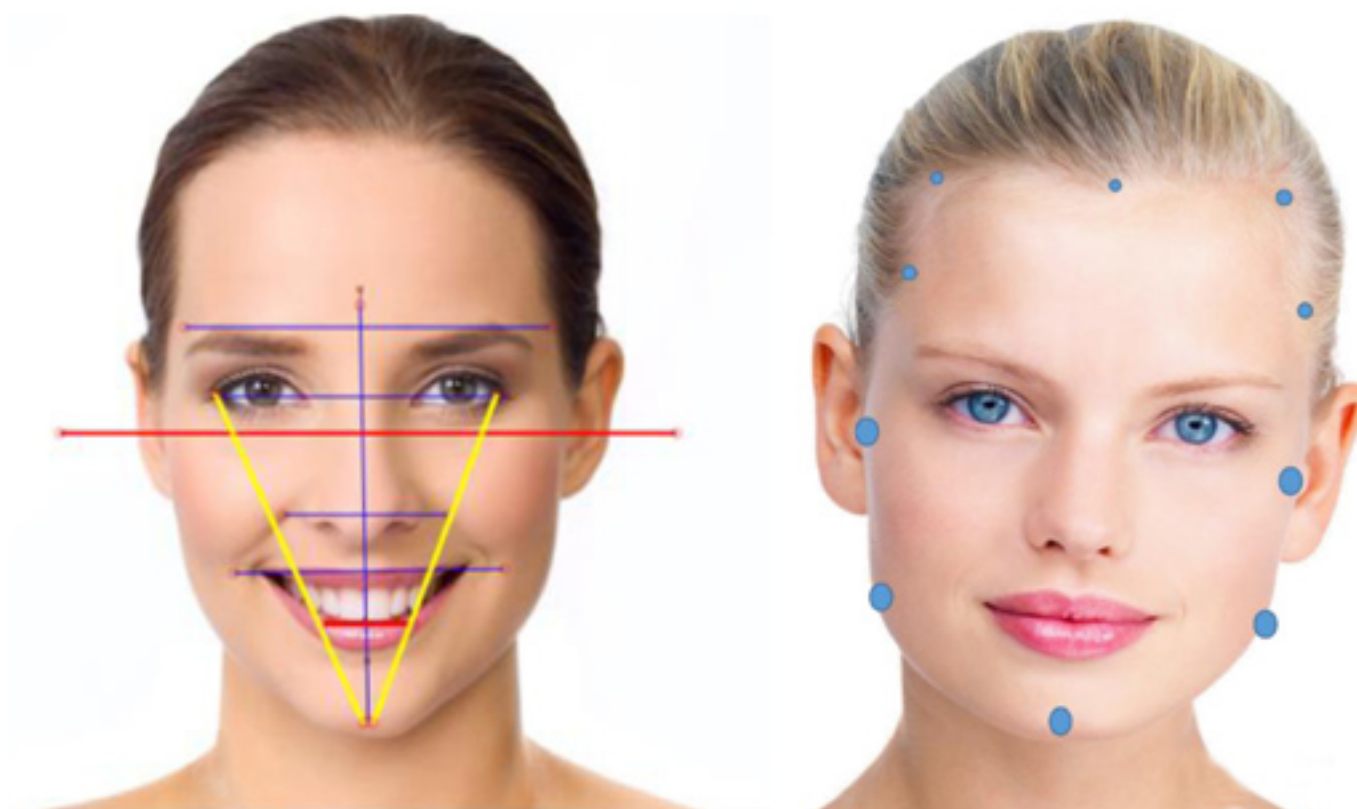


Fig 1 : Geometrical face mapping and parallel harmonization rules being used to create a perfect and harmonious smile

### SMYLIST® AND AVERAGE VALUES

The Smylist® concept, which is the creation of the principal author has a very different approach to average values used in dentistry. The Smylist® concept very clearly states that the application of average values in delivering therapy should not be used. The opinion is extremely clear and explicit that every

factor in the shape of the face & head in defining the custom proportions of the canine and centrals for eg .head shapes can be leptoprosopic euryprosopic or mesoprosopic. All these three types define different length/width ratios for the maxillary canines and incisors. Along with this, Smylist® has applied geometrical face mapping to create further rules which are applied

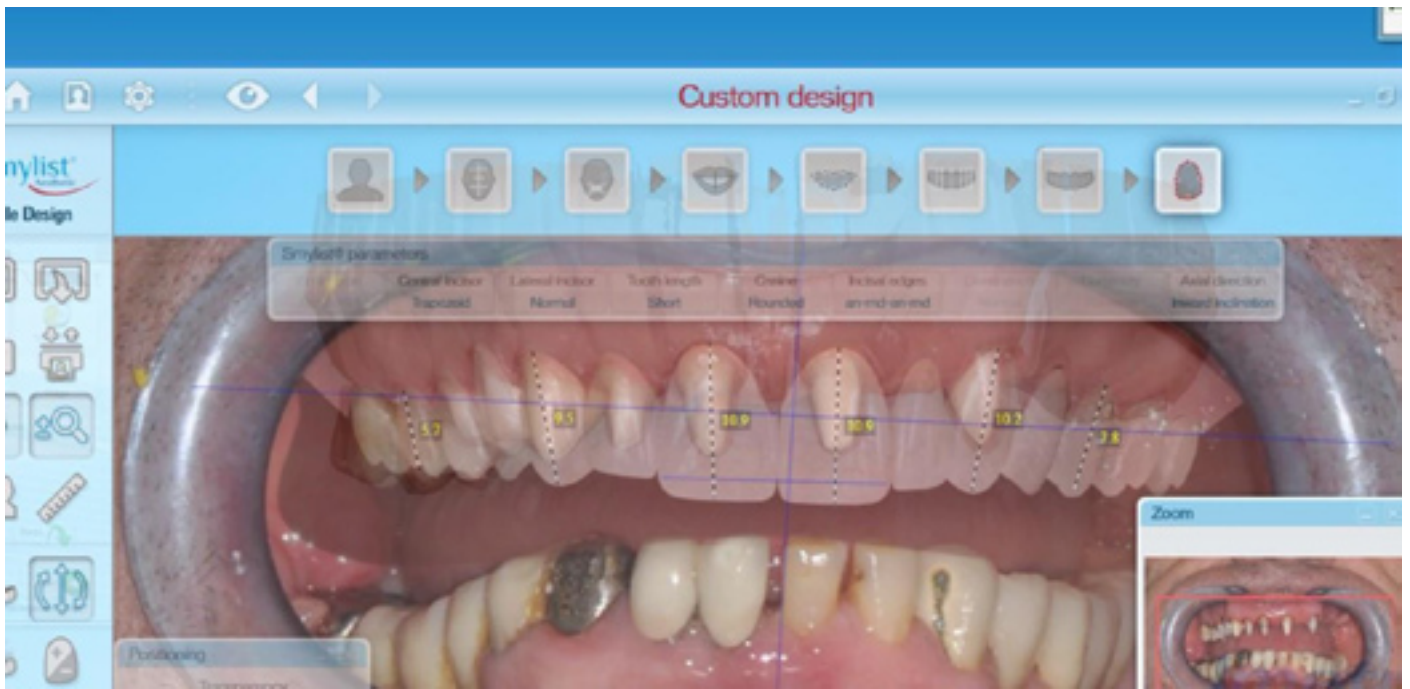


Fig 2 : The Smylist® Aesthetic design software provides the various dimensions for the case and at the same time allows visualization of the clinical work.

to calculate the customized height, width and shape of the teeth. The forehead, shape of the nose, the base on the nose are a few of the entities which are used by Smylist® for creating unique individual smiles as well as functional dentitions.

Each individual clearly is different than the others and hence requires custom teeth fabrication which factor in all the parameters of the particular individual only. Any average value is a move away from what is required for the individual.

The Smylist® Aesthetic Design Software and the Smylist® aesthetic rules provides the clinician with the tools to generate custom values for every individual patient and these values are what will provide the clinician with the specific information to create a customized dentition. It is only such a customized dentition which will be the best for an individual patient.

This is a screen shot of how the Smylist® Aesthetic Design software will generate actual numbers of length and width

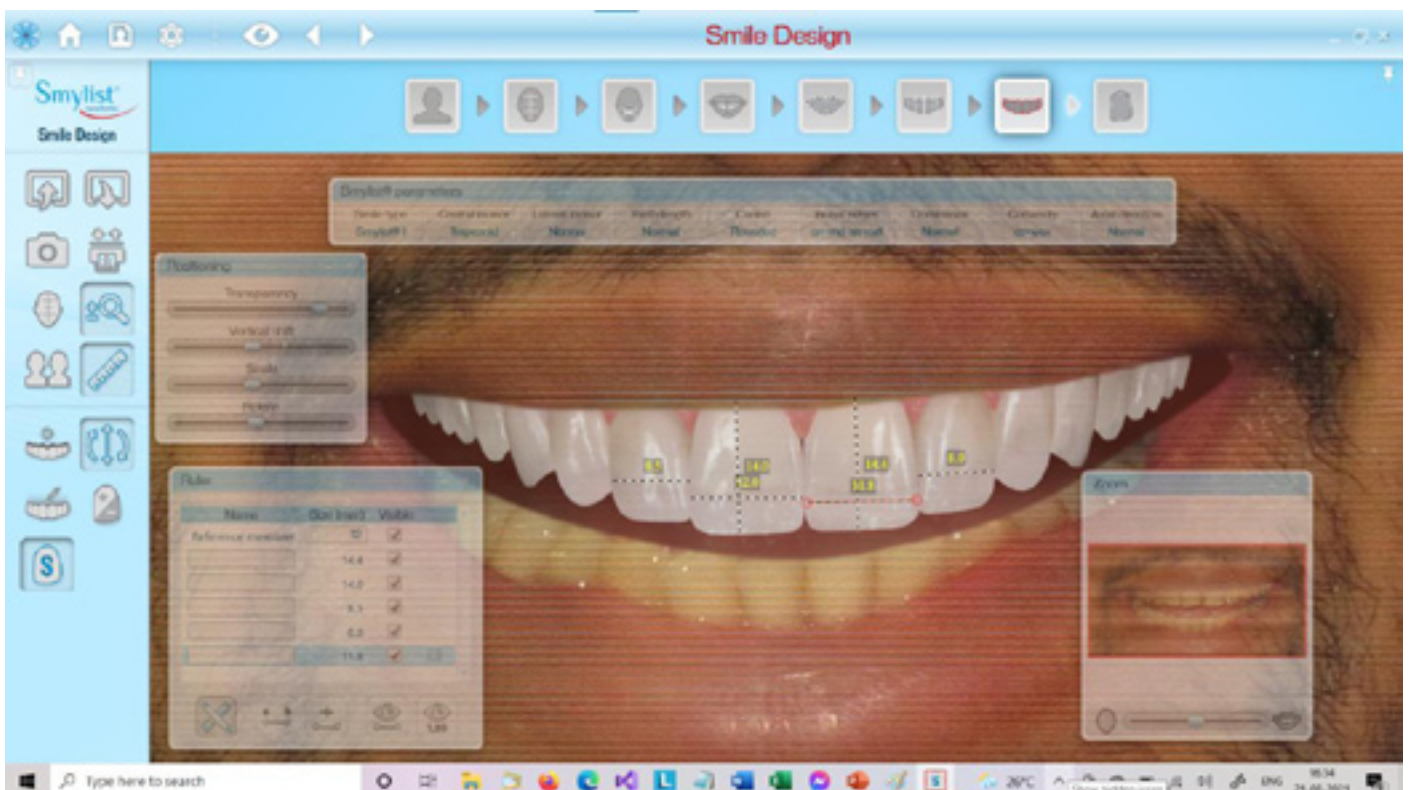


Fig 3 : One more Smylist® smile with an objective and exact measurement of all required teeth.



*Fig 4 : An individual smile/rehab completed using the Smylist® individual rules.*

of individual teeth based on the width and length of the face / head for the rehabilitation process for an individual patient.

#### **CONCLUSION**

Smylist® dentistry uses rules to create specific individual dentitions and has clearly demonstrated the shortcomings of using average values when attempting to redesign smiles or when rehabilitating a completely worn down dentition. The effectiveness of not using average values, but rather using specifically derived custom values makes all the difference in the longevity as well as the aesthetic result of the therapy.

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