

A Comparison of Two Dental Age Estimation Techniques in Contemporary American Whites: The Moorrees and Demirjian Approaches

Research Article

Tony L. Skanchy^{1*}, Maness H², Al Dayeh A³, Harris EF⁴

¹Orthodontic Graduate Student, Department of Orthodontics, School of Dentistry, University of Tennessee, Memphis, TN, USA.

²Assistant Professor, Department of Orthodontics, School of Dentistry, University of Tennessee, Memphis, TN, USA.

³Assistant Professor, Department of Orthodontics, School of Dentistry, University of Tennessee, Memphis, TN, USA.

⁴Professor, Department of Orthodontics, School of Dentistry, University of Tennessee, Memphis, TN, USA.

Abstract

Objective: Historically, dental age estimation has used the methods of Moorrees, Fanning and Hunt¹ and Demirjian, Goldstein and Tanner⁵. The purpose of this study is to apply these two methodologies to a contemporary sample of American whites, ages 9-14 years, and to evaluate the optimal concordance between the Moorrees (14-grade system) and the Demirjian (8-grade system) methods.

Materials and Methods: 199 pre-treatment panoramic radiographs of syndrome-free American white children, ages 9-14 years (97 boys, 102 girls), were evaluated by the author. Tooth mineralization stages were scored using seven left mandibular teeth using both techniques. The age of the subjects was predicted using the Demirjian and Moorrees approaches and compared to their actual (chronological) age. Survival analyses was performed, by sex, to include a comparison of the same sample of radiographs using the two methods of Moorrees et al. and Demirjian et al.

Results: Both methods, particularly the Moorrees approach, underestimated children's ages. Applying the Demirjian method resulted in a mean overestimation of 0.1 years for girls and a mean underestimation of 1.6 years for boys, while the Moorrees technique resulted in an average underestimation of 2.3 years for girls and 1.9 years for boys.

Conclusion: Neither the Demirjian nor the Moorrees techniques accurately estimate chronological age in our sample of contemporary American whites. The reason these methods underestimated chronological age is most likely multifactorial, due to differences in methods and environments.

Introduction

Differences in the development among children of the same chronological age have led to the concept of physiological age as a means of defining a person's progress towards biological maturity. Physiological age, or its frequently used synonyms of biological and developmental age, are measures for describing the status of a child, whereas chronological or calendric age convey only an approximation of this status because of the range in development observed for any given age [1].

Physiological age refers to the evaluation of maturation of one or more tissue systems. Developmental indicators include bone development, secondary sex characteristics, stature or weight [1] and

tooth development. Dental age can be determined by the emergence of teeth through the gingival tissues and also by assessing tooth mineralization by radiographic examination. Dental maturity has played an important role in estimating the chronological age of individuals because of the reported low variability of dental indicators [2] since mineralization rates are more controlled by genes than by environmental factors [3].

The assessment of tooth mineralization is a superior method of evaluation compared to tooth emergence for assessing dental maturation for several reasons. The majority of teeth can be assessed using tooth formation at any given time, while emergence only allows us to see the teeth at a specific phase of short duration in the continuous process of eruption. Emergence of a tooth is a short

*Corresponding Author:

Dr. Tony L. Skanchy,

Orthodontic Graduate Student, Department of Orthodontics, 875 Union Avenue, Memphis, Tennessee 38163, USA.

Tel: 859-489-1343

E-mail: tonyskanchy@yahoo.com

DrSkanchy@gmail.com

Received: March 05, 2016

Accepted: May 18, 2016

Published: May 20, 2016

Citation: Tony L. Skanchy, Maness H, Al Dayeh A, Harris EF (2016) A Comparison of Two Dental Age Estimation Techniques in Contemporary American Whites: The Moorrees and Demirjian Approaches. *Int J Forensic Sci Pathol.* 4(5), 243-248. doi: <http://dx.doi.org/10.19070/2332-287X-1600058>

Copyright: Tony L. Skanchy[®] 2016. This is an open-access article distributed under the terms of the Creative Commons Attribution License, which permits unrestricted use, distribution and reproduction in any medium, provided the original author and source are credited.