

Racial differences in pigmentation of the Fundus oculi¹

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An empirical evaluation of the correspondence between skin pigmentation and density of pigmentation in the Fundus oculi seemed desirable as a measure preliminary to further study of possible racial differences in perception. Fourteen Negro and 26 Caucasian males between the ages of 8 - 12 (matched for age on an approximately one to two basis), were rated for density of fundus pigmentation on a four point scale by an ophthalmologist. A close correspondence between race and fundus pigmentation density was found, with 12 of the 14 Negro children categorized in a distinctly denser class of fundus pigmentation than 24 of the 26 Caucasian children.

On finding differences between persons in European and non-European societies in perceptual phenomena, investigators have often concluded that the differences demonstrate the influence of "learning" on perception (e.g., Segall, Campbell, & Herskovitz, 1963, 1966). In addition to the cultural differences, however, the comparison societies have been composed predominantly of individuals with darker skin pigmentation. If differences in skin color were associated with differences in retinal pigmentation, then this would provide some evidence that the obtained differences in some perceptual phenomena could be related to physiological parameters. Ishak (1952a, b), for example, found differences at the blue end of the spectrum in luminosity curves obtained for Egyptian and European Ss which he attributed to differences in the density of macular pigmentation between the respective groups. Pollack (1965) has suggested that an increased density of retinal pigmentation with age is a possible factor "serving to render the visual receptor system less sensitive to those variables which underlie configuration, figure-ground contrast, intercontour distance and contour orientation." The present study describes a preliminary evaluation of the differences in pigmentation of the Fundus oculi² in American Negroes and Caucasians.

Subjects³

Ss were 40 male children between the ages of 8 and 12. The 14 Negro and 26 Caucasian children were matched for age on an approximate one to two basis.

Procedure

Gross ratings of pigmentation density of the fundus may be readily obtained using an ophthalmoscope. For this study an ophthalmologist⁴ using a Keeler ophthalmoscope was asked to rate Ss for density of fundus pigmentation⁵ on an appropriate scale. Examinations were begun with a basic two point "light" and "dark" distinction. As the number of Ss examined increased, several pronounced cases in both categories permitted

Table 1. Macular Pigmentation Ratings by Race.

	Light		Dark	
	1/1	1/2	2/1	2/2
Negro	0	1	9	4
Caucasian	7	17	2	0

the use of a four point scale. Rating 1/1 describes the lightly pigmented often called "blond" fundus and 2/2 a heavily pigmented slate gray appearing fundus, both still within the range of normality. The foveal region appears in each instance as a darker patch because of the macular pigmentation. The 1/2 and 2/1 ratings represent similar but slightly less pronounced "light" and "dark" distinctions.

Results

The ophthalmologist's rating of the 40 Ss on the four point scale is summarized in Table 1. The 1/2 and 2/1 ratings obviously identify the bulk of the Caucasian and Negro sample, respectively. Differences between races on a consolidated two point scale of density of fundus pigmentation yielded a corrected chi-square of 42.39 ($p < .001$). This examination supports the assumption that racial differences significantly predict discernible differences in density of pigmentation of the Fundus oculi. The possible consequences of this finding for perceptual behavior are to be investigated.

References

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Notes

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2. This includes the pigmentation of the choroidal and retinal pigmentation layers and the yellow pigmentation of the Macula lutea.
3. We are grateful for the cooperation of Mr. Ivan A. Baker, Superintendent of Schools, and the principals of the Algonquin, Beacon Hill, Blackhawk Elementary and Junior High, Mohawk, Westwood Junior High and Wildwood Schools in Park Forest, Illinois.
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5. Viewed at the posterior pole in ordinary light.