Impact Of Observer Age And Gender On The Visual Processing Of Faces.

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INTRODUCTION: Our research is fundamentally interested in the factors leading to the differential perception of patients with congenital or acquired facial difference. The scientific literature has provided little information regarding the impact of *observer age and gender* on the early stages of visual processing of the human face[1-2]. In order to investigate the impact of those factors, we employed eye-tracking technology.

Purpose:

Our goal is to better understand how faces are perceived with the knowledge that early perception may have long-term implications on relationship development[3-5]. Elucidation of early visual processing of faces may better inform surgeons' conversations with their patients by improving understanding of how faces are reflexively interpreted by others. This knowledge may also help focus surgical reconstructive priorities.

METHODS: 118 experimental and 79 control facial images were obtained from the senior author's practice. Experimental images included: 29 cleft lip, 22 facial aging, 18 facial lesion, 16 ear deformity, 14 HIV lipodystrophy, 11 nasal deformity, 6 dermatochalasis. Control images were age-matched to experimental. Twenty standardized lookzone regions were mapped onto each facial image.
265 subjects were recruited to observe a randomly chosen subset of 40 images (20 experimental/20 control age-matched) while an infrared eye-tracking camera continuously recorded their pupillary response.
Factorial ANOVA analysis was performed to determine significance of differences between groups.

Outcomes Measured:

The total number of eye fixations within different lookzone regions was recorded. Factorial ANOVA analysis was performed to determine significance of gaze patterns between groups.

RESULTS: The following observations were statistically significant at $p<0.01$ level:

(i) women look at the periorbital region more than men do; men look at the middle facial region more than women do
(ii) women and men both look at women's eyes more than at men's eyes
(iii) older observers look at the perioral region more and the periorbital region less than younger observers

CONCLUSIONS: By describing the age and gender-related patterns of reflexive facial surveillance, this report offers a more nuanced idea about where and how we inspect human faces than has previously been documented in the literature. A construct emerges from this study suggesting that the gender of both observer and facial object, as well as the age of the observer, influence the visual focus of early impression formation.

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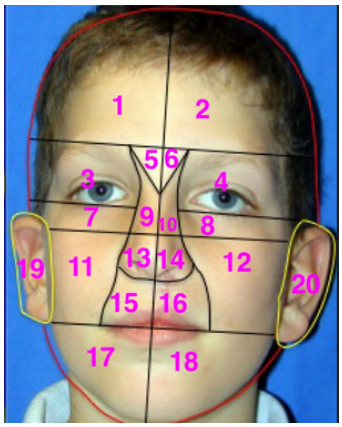
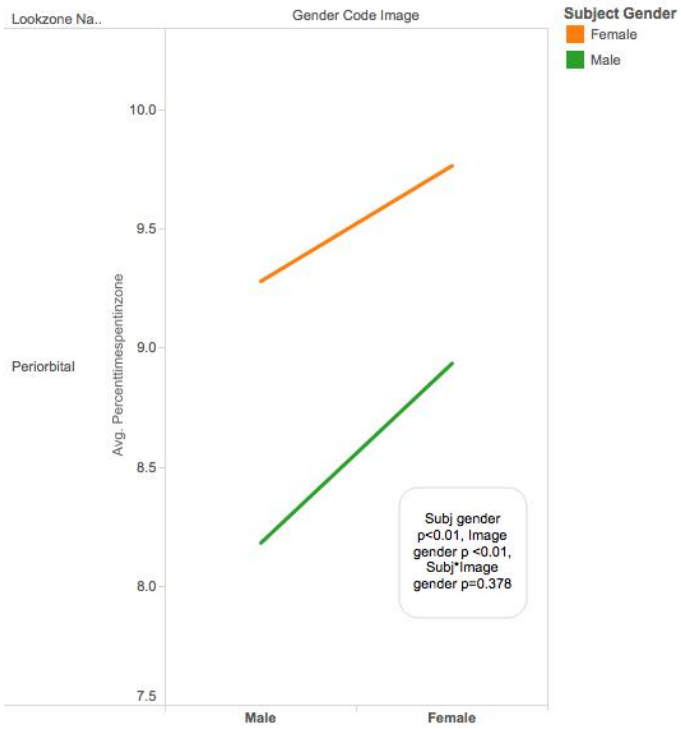


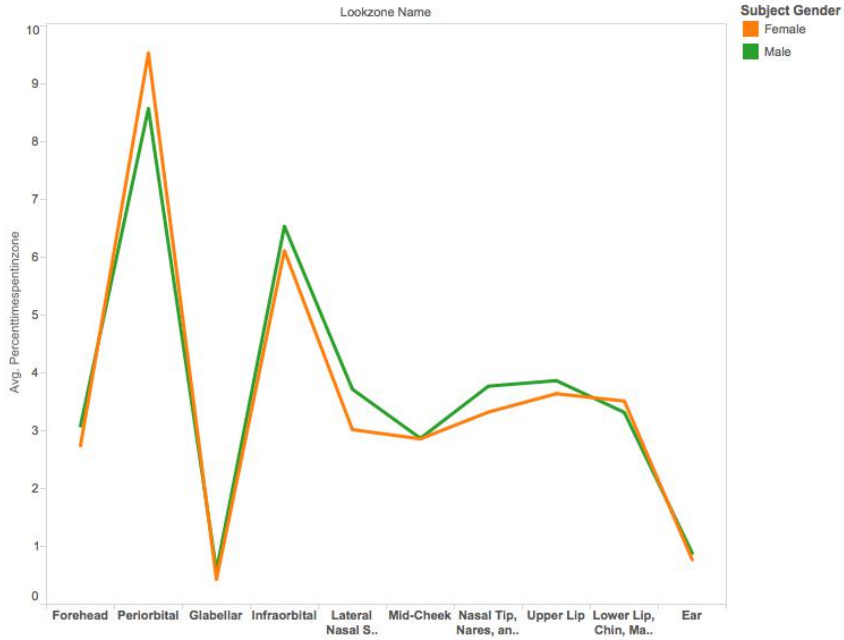
Lookzone Regions: R/L:
1/2: forehead
3/4: periorbital
5/6: glabellar
7/8: infraorbital
9/10: lateral nasal sidewall
11/12: mid-cheek
13/14: nasal tip, nares, and columella
15/16: upper lip
17/18: lower lip, chin, mandible
19/20: ears
(Note the lookzones 1 and 2 are bordered by the eyebrow, 3 and 4 borders by the lower eye, 7 and 8 by the eyebags, 15 and 16 by the midlip opening, 11 and 12 by the nasolabial fold, and 17 and 18 by the chin)

Gender Image vs Subject Periorbital TimeinZone



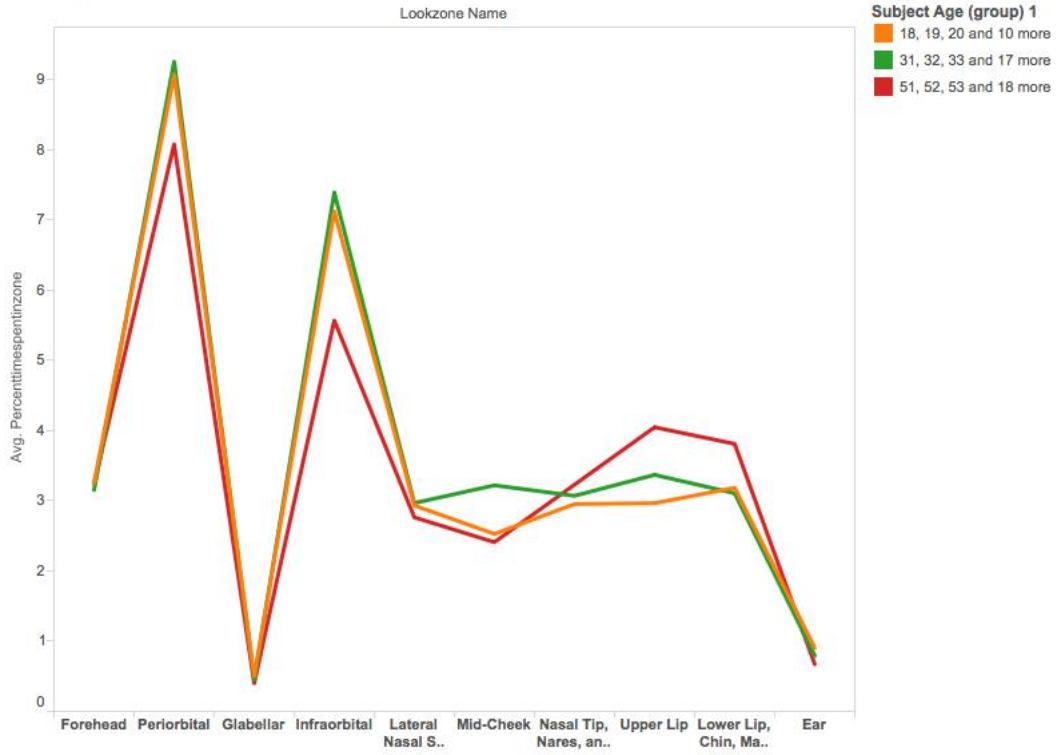
The trend of average of Percenttimespentinzone for Gender Code Image broken down by Lookzone Name. Color shows details about Subject Gender. The view is filtered on Subject Gender and Lookzone Name. The Subject Gender filter keeps Female and Male. The Lookzone Name filter keeps Periorbital.

Gender Time In Zone



The trend of average of Percenttimespentinzone for Lookzone Name. Color shows details about Subject Gender. The view is filtered on Subject Gender, which keeps Female and Male.

Subj Age Lookzone Time



The trend of average of Percenttimespentinzone for Lookzone Name. Color shows details about Subject Age (group) 1. The data is filtered on Primary Code and SS#. The Primary Code filter keeps 10 of 18 members. The SS# filter keeps 1, 2 and 3. The view is filtered on Subject Age (group) 1, which excludes Null.