

# Smile Wrinkles: Why You Should Whistle While You Work (And Not Smile)

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## BACKGROUND

One of the most contentious areas of neurodermatology is the question of whether excessive smiling leads to excessive wrinkling. Humans are the only species known to smile, a dystonic facial movement that is highly variable within and between individuals, depending on which muscles are involved and to what degree. Although some primates have facial muscles that can create a smile-like appearance, this is not generally thought to be reflective of a jovial mood. Obviously, as muscles contract, the overlying skin must fold, hence, “wrinkle,” producing lines that are transient (assuming the subject does not have a neuromuscular disorder, such as myotonia), resolving as the smile dissipates, dependent on skin turgor, which varies considerably within and between individuals, skin elasticity, subcutaneous fat and brain neuronal relaxation time. The technical term for a fine crease or fold in the skin is “rhytide,” with deeper folds meriting the more common term, wrinkle (NB: the criteria for distinguishing a wrinkle from a rhytide are not uniform). Wrinkles around the mouth are called “perioral wrinkles,” and lines from the corner of the mouth to the chin are called “marionette lines” (technically, melomental lines). A “facelift” is technically a “rhytidectomy.”

Ancient papyri noted that “persons of dour demeanor bear a facial appearance devoid of lines of concern or joy.” Plato noted that “those who jest excessively tend to appear more aged,” which he attributed to tendencies toward repeated inebriation. And, through the centuries, one can see the smooth faces of kings and generals in paintings and sculpture intended to depict a stern demeanor.

Whether a persistently serious facial expression leads to fewer wrinkles than less serious expressions has been discussed for many years, extending back at least a millennium, noted briefly in Balbantha’s treatise, *Bloodletting, A User’s Guide* (circa 1147).

## OLD STUDIES

Some retrospective studies provide perspective. A novel study from 1977 compared standardized black-and-white photographs of Caucasians who had been prizewinners (state and national) in the “Best Smiles’ Contests” held between 1920 and 1925 with subjects of similar age who had been members of the “Serious Men’s Society,” often known as the “Dour Men’s Society.” They concluded, using statistical methods now considered laughably understandable, that “men of dour demeanor have smoother facies.” There are, of course, many caveats to the interpretation of all retrospective studies, but other, similar studies obtained comparable results. A group of blinded researchers used a Likert scale of 0 (no change) to 10 (extraordinarily terrible wrinkling changes) to rate the early

versus late images with the subjects not smiling, in a study of men only. The quality of photographs was suboptimal. The baselines, of people primarily in their late teens in the early photos had virtually no wrinkles (Table 1), whereas 50 years later, most did. The scores show an obvious difference with  $p < .001$  between baseline and old age, as expected, but the differences between the changes over time favor the grim group, with a large effect size as well. Secondary-outcome variables, however, documented a larger attrition rate, largely due to death, in the grim group. Another study, using only photos from members of the “Optimists of America” fraternal group, compared recent to old photos 25 years or older, to an age-matched “grim” group and reported similar outcomes, although the optimists lived longer ( $P < .005$ ).

## THE MODERN ERA

Future-generation, geo-millennial adaptations of Fourier-quantal transforms, using topographic mapping extrapolated to irregular surfaces, substituting skin temperature for geothermal input, and elasticity, seborrhea, and turgor for

Table 1

Metric	Mean baseline	Mean/p:15 years	Mean/p:25 years
Wr /cm <sup>2</sup> total			
Wr depth	0.0	0.2	1.0
Wr eyes length	0.0	0.0	0.0
Wr marionette length (mean)	0.0	4.0	14.8
Wr volume	0.0	12.0	49.5
Wr Perioral	0.0	26.3	59.3
Wr Perioral volume	0.0	18.7	36.9

Wr/cm volume-in cubic millimeters

Lengths are in millimeters

Standard deviations are corporate secrets



**Image 1.** Predicted facial wrinkles of author in 15 years if he continues smiling at his current rate.

topographic features, has altered the clinical trials' spectrum in this area. While the initial geological studies for predicting continental drift and mountain growth used time estimates in the millions of years, modern rhytid research uses seconds (1 million seconds=116 days) to estimate future changes. Instead of having to wait 25–40 years to determine if smiles increase the perioral wrinkle lines or the marionette folds, studies can now be completed in only two years. We can now predict where, how long, and how deep the folds will be as a function of current skin turgor, elasticity, facial expression changes monitored for a week (while awake and asleep), and neuronal relaxation time. This assumes, of course that smiling frequency remains constant.

#### CURRENT STUDY: METHODS

Chronic gum and tobacco chewers were excluded in baseline studies. Men with beards were also excluded. Smoking and being edentulous were also exclusionary. Mustaches were permitted. A randomly obtained cohort of 100 25-year-old adults trained not to smile compared to age- and gender-matched cohorts of equal size, one with no intervention (control group) and the other forced to watch comedic TV for two hours daily, could be completed in only two years, as the analysis is thought to reliably predict wrinkle development 43 years in advance.

#### CURRENT RESEARCH SUMMARY

In this pilot study, approved by the Universal Medicine and Pharmaceuticals Hedge Fund International IRB (Cayman Islands), volunteers, aged 25 years, non-smokers, 250 of each gender who had microscopic facial muscle implants and carried cell phones that used the Rhytid Wrinkle App (RWA), which recorded facial expression 24 hours/d for 30 days in 2020. It also used implanted skin sensors (patent pending) that collected data each minute. Photographic images of the face only, with hair and jewelry deleted, were made at baseline and created using robotic process automation (RPA) to predict facial features at years 40, 60 and 80. Images were randomly ordered and wrinkles compared by visually guided artificial intelligence devices that scanned two billion images of faces. Five thousand images graded by AI were randomly chosen for visual scoring by our experts.

#### RESULTS

Our AI program assessed current faces with a reliability that exceeded our expert neuro-dermatologist's, with kappa >98. Our program predicting future wrinkling clearly documented a clinically and statistically significant difference in perioral wrinkles and marionette lines in those of serious facial expression compared to smilers. Forehead wrinkles and

upper-neck wrinkles were not different. We expect that it will take 43 years to confirm that our results are accurate.

#### DISCUSSION

Retrospective data was used to inform methodological updates that incorporated cutting-edge technology from geohistorical research to predict wrinkling patterns. These data predict an increase in wrinkling, in age of onset of initial changes, area of distribution and severity (depth x-length) of wrinkles, that is non-linear. We predict a threshold for duration and "strength" of smiling that will produce smile wrinkles, above which the greater time spent smiling, the more likely smile wrinkles are to occur. (**Image 1.**)

#### CONCLUSIONS

Laughing on the inside but smiling less is a prudent approach to social interactions for those who seek to avoid facial wrinkling.

As an aside, we note that there has been considerably less interest in frown wrinkles, as people afflicted with this disorder tend to not care about them. ❖

#### Author

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#### Disclosure

*Editor's note:* April Fools' Day commentary!