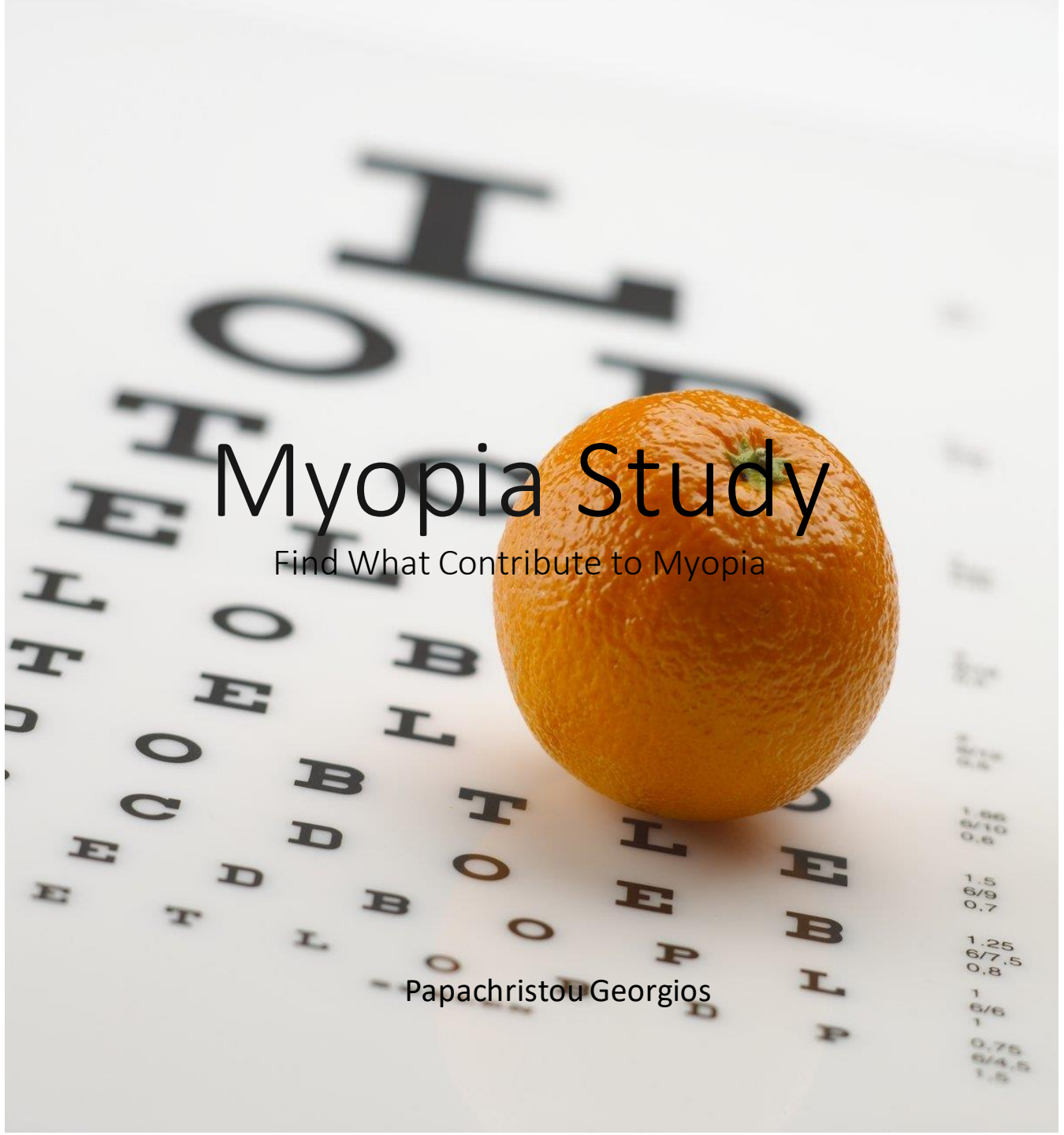


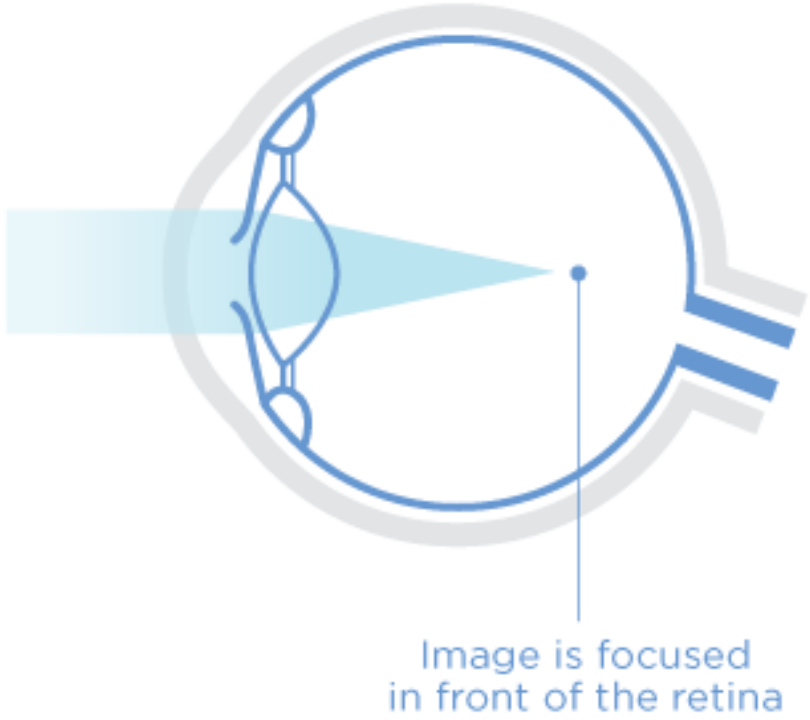
Myopia Study

Find What Contribute to Myopia

Papachristou Georgios

Analysis Goal

- Physiological Variables
  - age, gender, eyeball parameters
- Environmental Variables
  - time spent on near-work and outdoor activities
- Hereditary Variables
  - myopic mother or/and father



DATASET

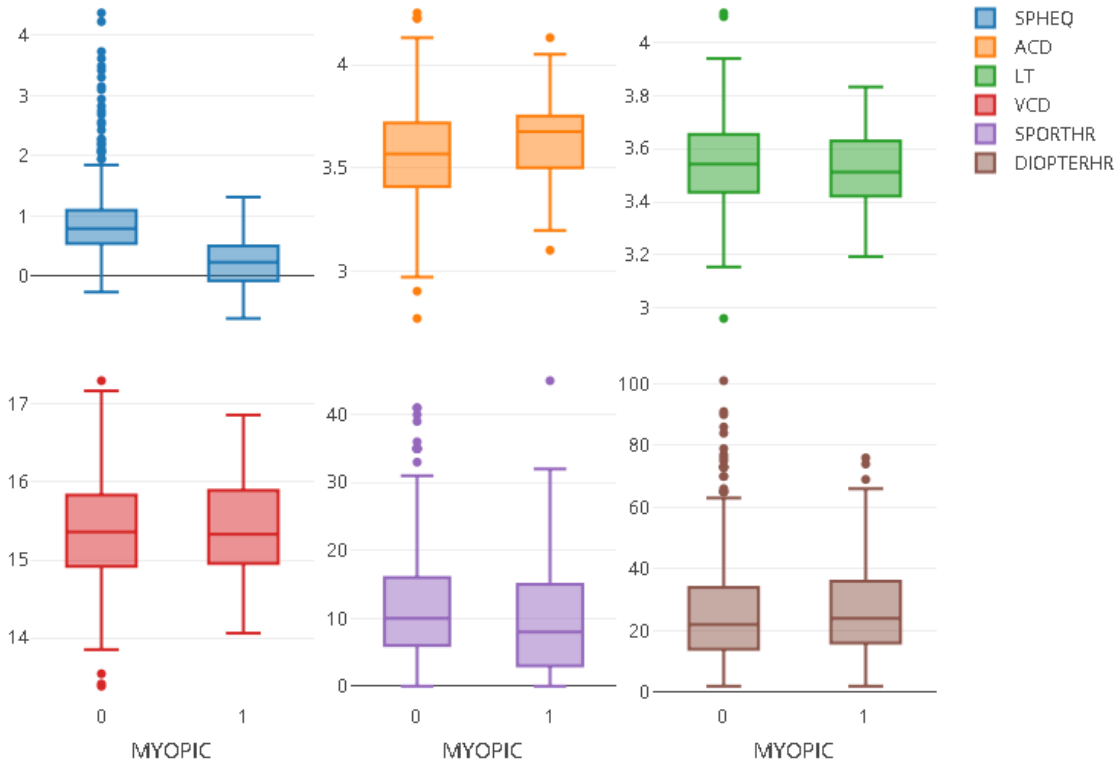
- The dataset has **618 observations** and **17 variables**
- The subjects are children **5 to 9 years old**
  (No Myopic in the beginning (**Spherical Equivalent Refraction > -0.75 D**)

Variables Table Description

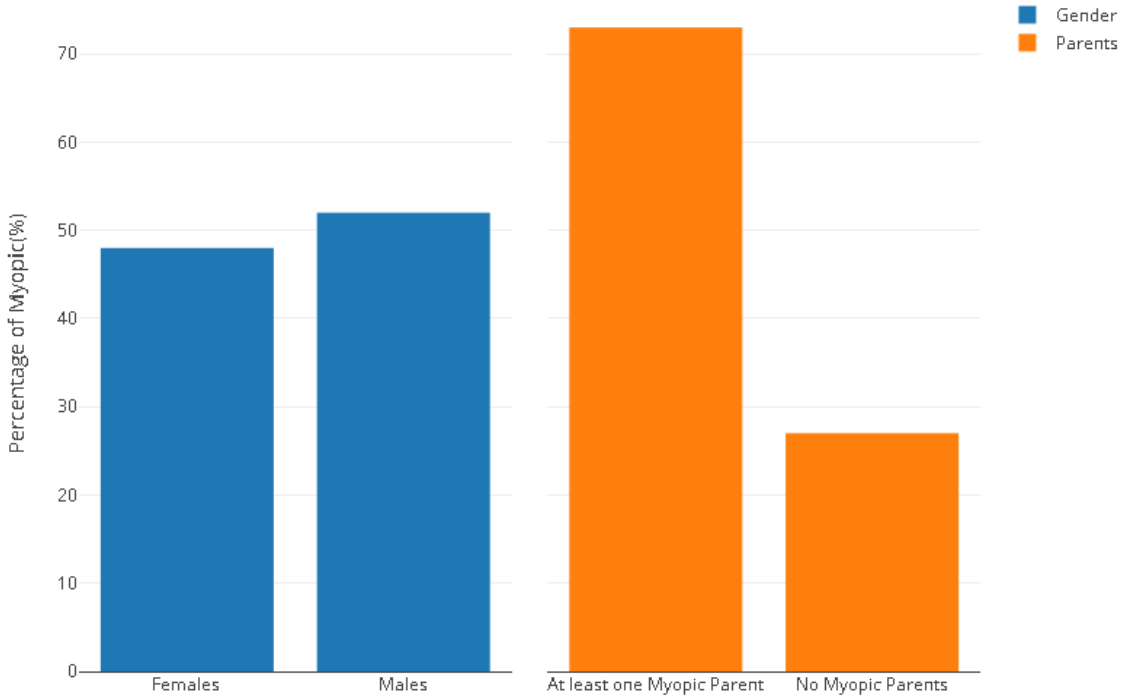
Description	Value/Unit	Name
Year subject entered the study (numerical variable)	year	STUDYYEAR
Myopia within the first five years of follow up (categorical variable)	0 = No; 1 = Yes	MYOPIC
Age at first visit (numerical variable)	years	AGE
Gender (categorical variable)	0 = Male; 1 = Female	GENDER
Spherical Equivalent Refraction (numerical variable)	diopter	SPHEQ
Axial Length (numerical variable)	mm	AL
Anterior Chamber Depth (numerical variable)	mm	ACD
Lens Thickness (numerical variable)	mm	LT
Vitreous Chamber Depth (numerical variable)	mm	VCD
Time spent engaging in sports/outdoor activities (numerical variable)	hours per week	SPORTHR
Time spent reading for pleasure (numerical variable)	hours per week	READHR
Time spent playing video games/working on the pc (numerical variable)	hours per week	COMPHR
Time spent reading/studying for school assignments (numerical variable)	hours per week	STUDYHR
Time spent watching television (numerical variable)	hours per week	TVHR
Composite of near-work activities (numerical variable)	hours per week	DIOPTERHR
Myopic Mother (categorical variable)	0 = No; 1 = Yes	MOMMY
Myopic Father (categorical variable)	0 = No; 1 = Yes	DADMY

Variables Visualization

Numerical Variables Distributions



Categorical Variables Distribution



Model Selection

- We selected the model according:
  - Initial Descriptive Analysis
  - AIC Criterion (lower value is better)
  - Interpretation Difficulty Level
  - Low VIF (<10)
  - Residual Deviance/Degrees of Freedom (appropriate value is ≈ 1)

So the final model (Logistic model) is:

$$\text{Logit}(p) = -5.90 + 0.73 \times \text{FEMALE} + -3.83 \times \text{SPHEQ} + 1.37 \times \text{ACD} - 0.05 \times \text{SPORTHR} + 1.39 \times (\text{ONE PARENT IS MYOPIC})$$

Conclusion

- If the **gender is female (FEMALE)** then the **probability increases** 107% (In this model the reference level is male)
- If the **spherical equivalent refraction (SPHEQ)** decreases 0.05 D then **probability increases 21%** (the more negative the spherical equivalent, the more myopic the subject)
- If the **anterior chamber depth (ACD)** increases 0.1 mm then the **probability increases 10%**
- If the subject increases **the time spent engaging (SPORTHR)** by 1hour per week the then **probability decreases 5%**
- If one of both parents is myopic**(ONE PARENT MYOPIC)** then the children will have **300% higher probability** to be myopic

Thanks for your time!!