



UNIVERSITÀ  
DEGLI STUDI  
FIRENZE

# Viewing distance and character size in the use of smartphone in presbyopic and non-presbyopic individuals

Paolo Antonino Grasso, Massimo Gurioli, Laura Boccardo

108° congresso nazionale della Società Italiana di Fisica  
Milano, 12-16 settembre 2022



UNIVERSITÀ  
DEGLI STUDI  
DI MILANO

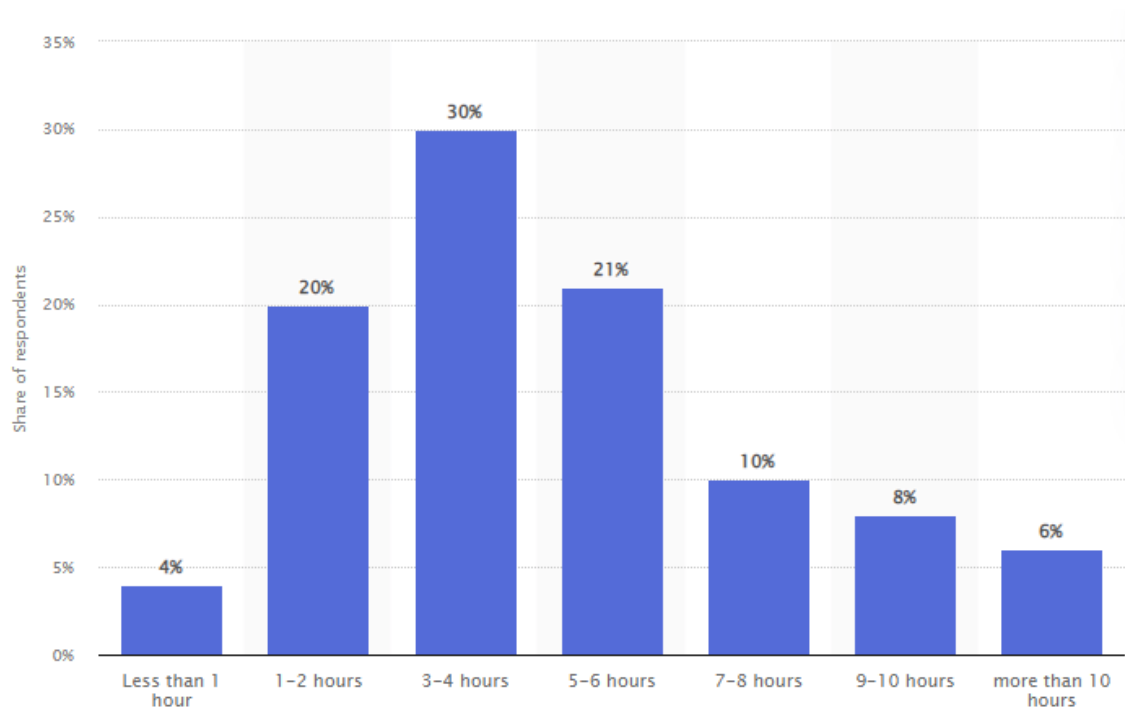


**POLITECNICO**  
MILANO 1863



# Introduction

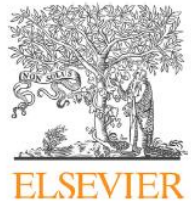
**How much time have you spent using your smartphone in the last 24 hours?**



<https://www.statista.com/statistics/1084948/daily-usage-of-smartphone-in-italy/>



# Introduction



Journal  
of **Optometry**

[www.journalofoptometry.org](http://www.journalofoptometry.org)



ORIGINAL ARTICLE

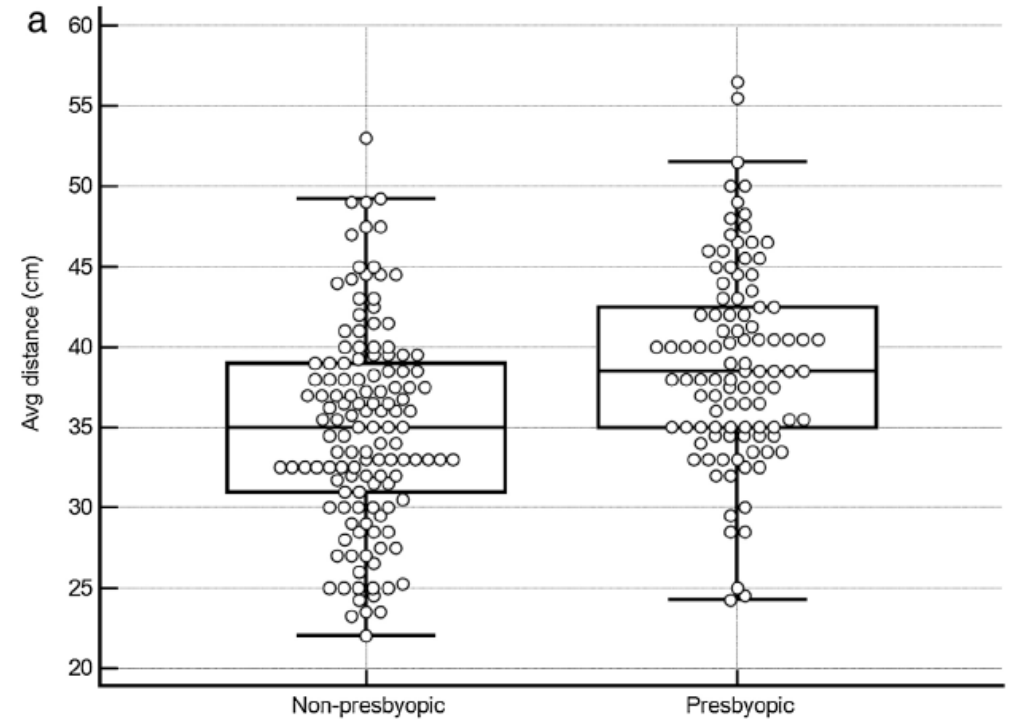
## Viewing distance of smartphones in presbyopic and non-presbyopic age

Laura Boccardo <sup>a,b</sup>

<sup>a</sup> Institute for Research and Study in Optics and Optometry (IRSOO), Vinci, Italy

<sup>b</sup> School of Mathematical, Physical and Natural Sciences (Optics and Optometry), University of Florence (UNIFI), Italy

Received 7 February 2020; accepted 16 August 2020



# Methods

## Participants

N = 217

157 non-presbyopics (mean age: 23.7; std: 4.13)

60 presbyopics (mean age: 53.9; std: 5.98)

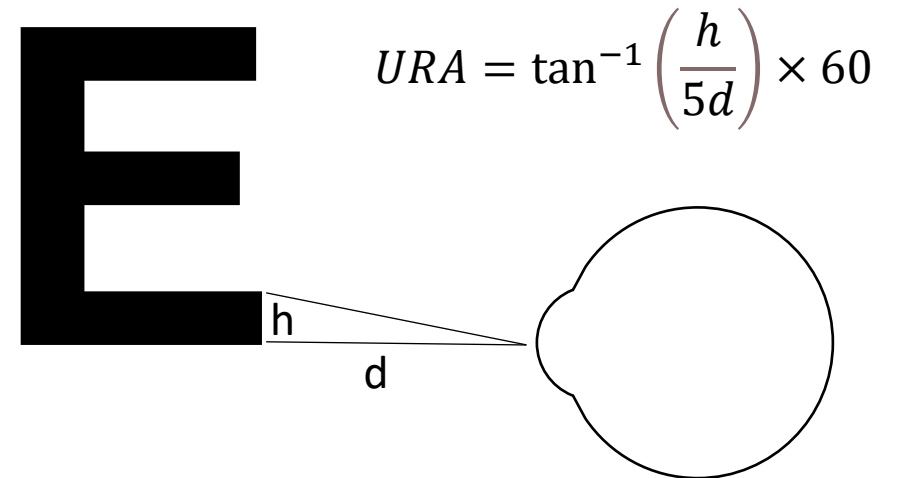
### Reading distance



### Adopted character size



### Usual reading angle (URA)

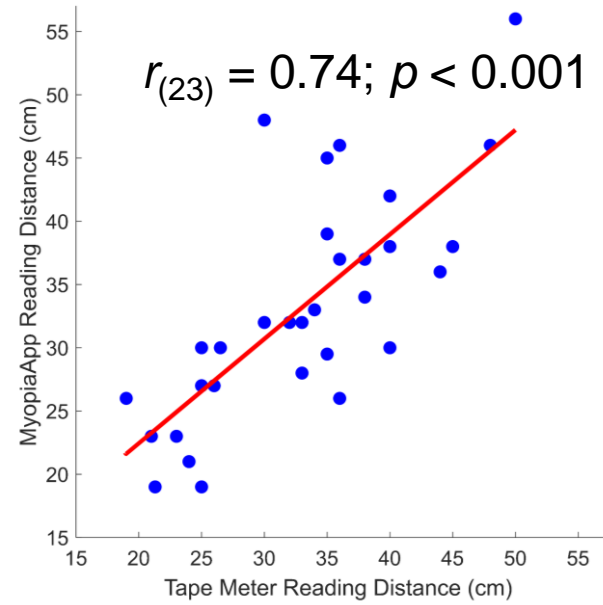
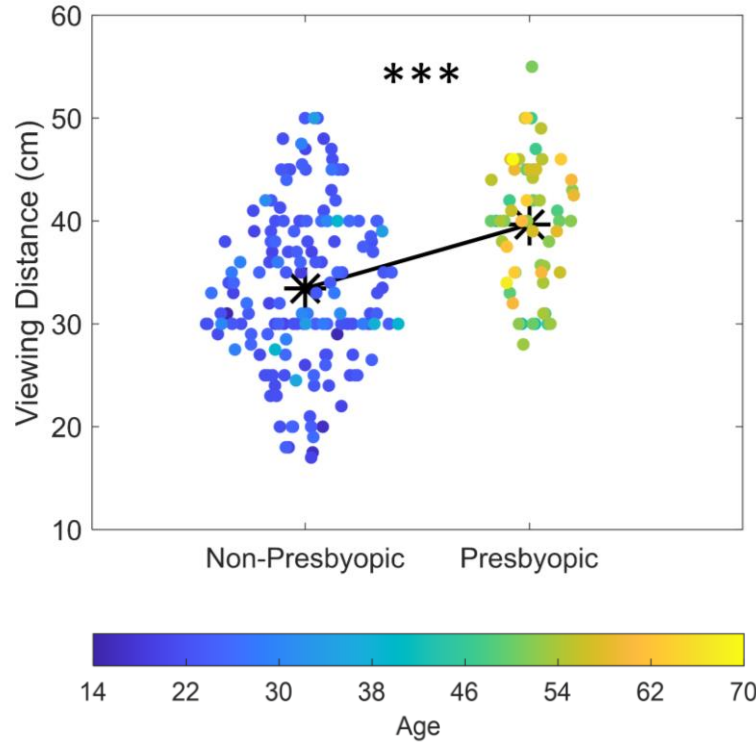


### Accommodative demand

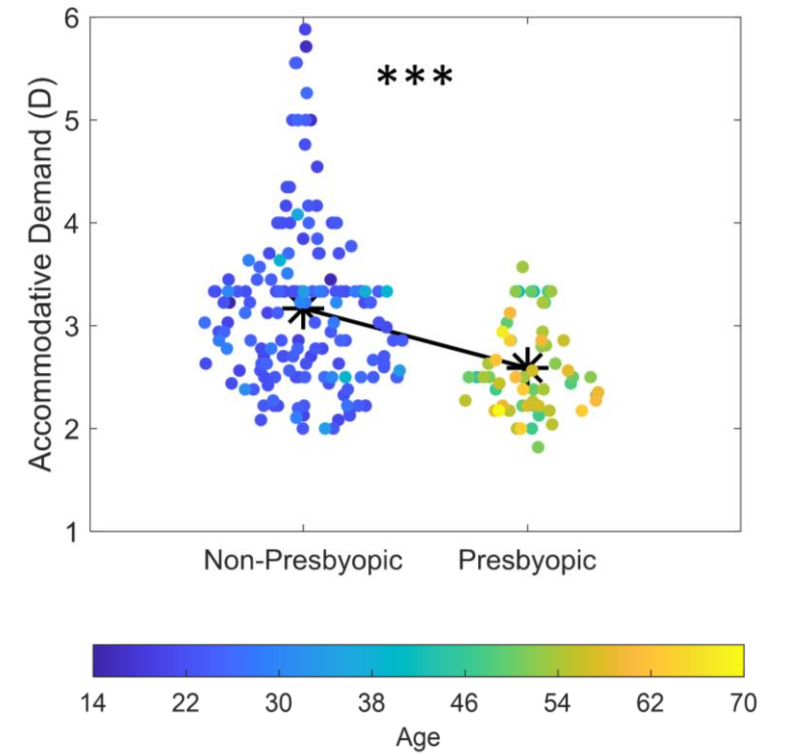
$$K = \frac{1}{d}$$

# Results

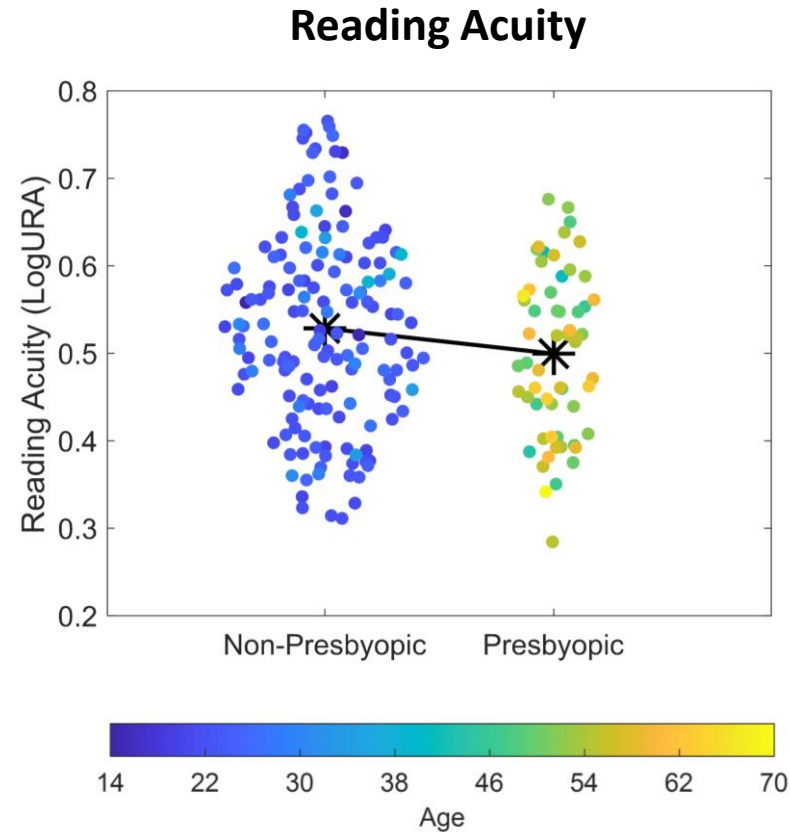
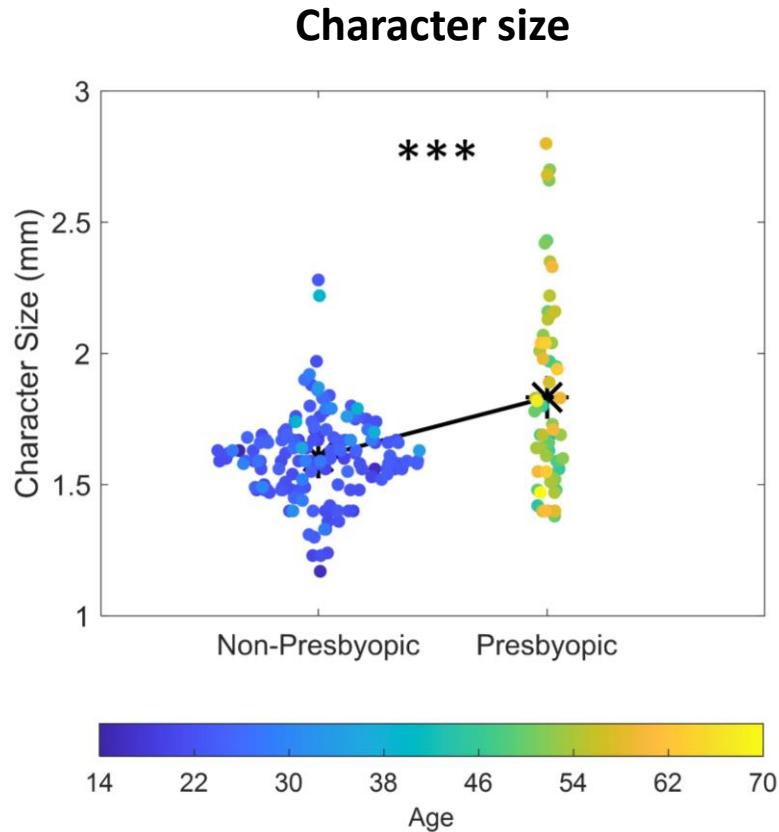
## Reading distance



## Accommodative demand



# Results



- No difference in reading distance, character size and reading acuity between different types of corrections
- No difference in screen dimension between presbyopics and non-presbyopics
- Presbyopics reporting reading difficulties at NAVQ (i.e., scores below 10) adopted larger character sizes

## Conclusions

---

- Significant difference between presbyopes and non-presbyopic in reading distances adopted while using a smartphone. Younger individuals are much more exposed to a high accommodative demand as compared to older individuals.
- Presbyopes tend to use larger character sizes but similar screen sizes, a behaviour potentially leading to reading discomfort.
- The use of larger character sizes in presbyopes seems to be a good predictor of individuals experiencing near vision difficulties (NAVQ > 10).

### **Take home message and future directions**

Measuring visual habits in the use of smartphones can provide important insight on the visual health of individuals. An online monitoring of changes in visual habits can potentially provide individuals with suggestion on when there is a need for an optometric examination.

In a word: TELEOPTOMETRY