

**UNIVERSITI TEKNOLOGI MARA**

**POSITIVE AND NEGATIVE RANGE OF  
ACCOMMODATION AND VERGENCE  
MEASURES OF DRIVERS AND NON-  
DRIVERS BASED ON REFRACTIVE ERROR**

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## AUTHOR'S DECLARATION

I declare that the work in this dissertation was carried out in accordance with the regulations of University Teknologi MARA. It is original and is the results of my own work, unless otherwise indicated or acknowledged as referenced work. This topic has not been submitted to any other academic institution or non-academic institution for any degree or qualification.

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## ABSTRACT

**Purpose:** This study was to determine the positive and negative range of accommodation and vergence measures of drivers and non-drivers based on refractive error. **Method:** Fifty-two of UiTMPuncakAlam students with range of age from 20 to 25 years old were recruited in this cross sectional study. Pilot study was conducted to establish the intra reliability among four examiners participated in this study. The subjects need to pass all the inclusion criteria in the screening procedures before proceed into data measurement procedures. For the range of accommodation, NRA were measured first by using plus lens, follow with PRA using minus lens. For the vergence range, we measured using step vergence technique using prism bar. NFV were measured using base-in prism, followed with PFV by using base-out prism. For the subjects who drive, they were brought to measure their driving setting, which include the distance of eyes to the dashboard and rear mirror using the same car. **Results:** Kruskal-Wallis test revealed statistical significant difference of NRA between emmetropic drivers and myopic drivers with p value 0.017. NRA between myopic drivers and myopic non-drivers also had shown statistical significant difference with p value of 0.026. There were no statistical significant differences of the positive range of accommodation and vergence measures of drivers and non-drivers based on refractive error. The distance from dashboard and rear mirror also showed no statistical significant difference based on refractive error, with p value of 0.225 and 0.326 respectively. **Conclusion:** NRA of emmetropic drivers was significantly lower compared to myopic drivers. However, other parameters tested were not significantly difference which could be due to the absence of driving task in this study. Future study might have to look into the involvement of driving task on the range of accommodation and vergence measures.

**Keywords:** Range of accommodation, vergence measures, refractive error, driver

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