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The Effect of Ophthalmic Blue Blocker Filters and Anti-Reflective Coats on Digital Reading Efficiency and Comfort

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INTRODUCTION

With increasing time spent on devices, there is rising interest in the use of blue light blocking (BB) filters and antireflective (AR) coats on lenses to reduce symptoms of digital eye strain. Since AR coats and BB filters both separately and combined are widely available from professional and nonprofessional sources, guidance about their benefits is needed.

Current research is inconclusive about the possible positive effect of BB filters on digital eyestrain. Due to differences in variables measured and their results, benefits of these filters on eye strain are unclear. Clinical research is about the effect of AR coats alone and in combination with BB filters on digital eyestrain is limited. This study looks to expand the emerging data on BB filters .



TABLE 1
Symptoms and p_Value

Symptom	p_value
Blurred Vision while viewing the text	0.45
Blurred vision when looking in the distance at the end of the near task	0.49
Difficulty or slowness in refocusing eyes from one distance to another	0.96
Irritated or burning eyes	0.71
Dry eyes	0.78
Eye strain	0.94
Headache	0.65
Tired eyes	0.56
Sensitivity to bright lights	0.65
Discomfort in your eyes	0.74

PURPOSE

We conducted an experiment to identify and evaluate the possible effects of commercially available BB and/ or AR coatings compared to coating-free control lenses. Outcomes assessed were pursuit and saccade eye movements, fixation, reading rate, and subjective assessments of digital eye strain symptoms.

METHODS

- Twenty-eight emmetropic or contact lens corrected subjects (ages 22-31 years old; 10 male, 18 female) completed study.
 - No previous dx of accommodative/ BV issues, congenital color deficiency or dry eye
 - Denied routine use of artificial tears with digital device use
- Subjects wore clear, un-tinted BB, AR, BB/AR, and control (coating-free) lenses in a randomized order and completed the following
 - Pursuit, saccade and fixation assessments via RightEye® testing
 - A 20-minute reading task while wearing each of the lenses
 - A questionnaire regarding their eye strain symptoms See Table 1
- Analysis of variance tests were used for statistical analysis.

FIGURE 1
Change in Fixation

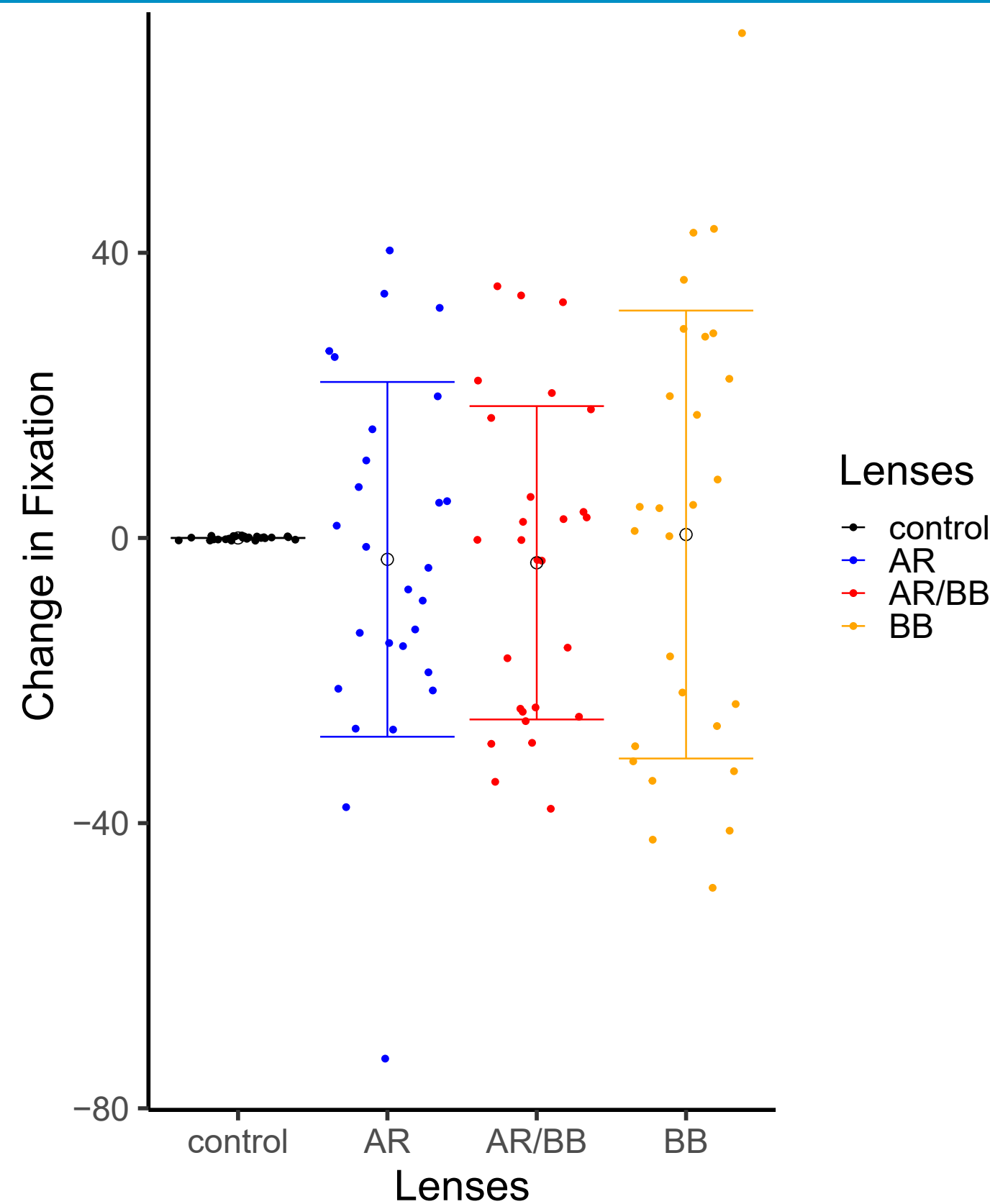


FIGURE 2
% Change in Reading Rate

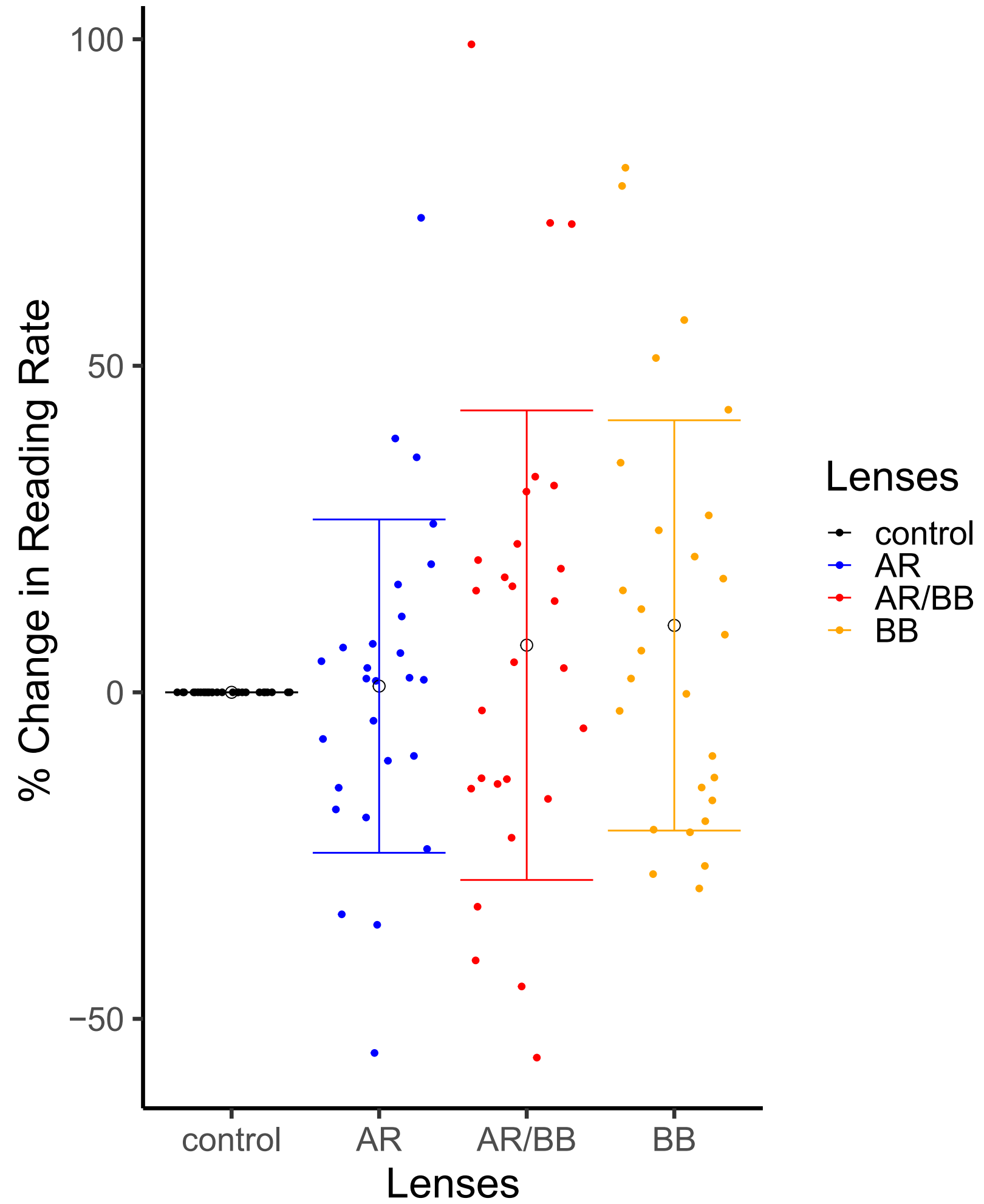


FIGURE 3
Change in Pursuits

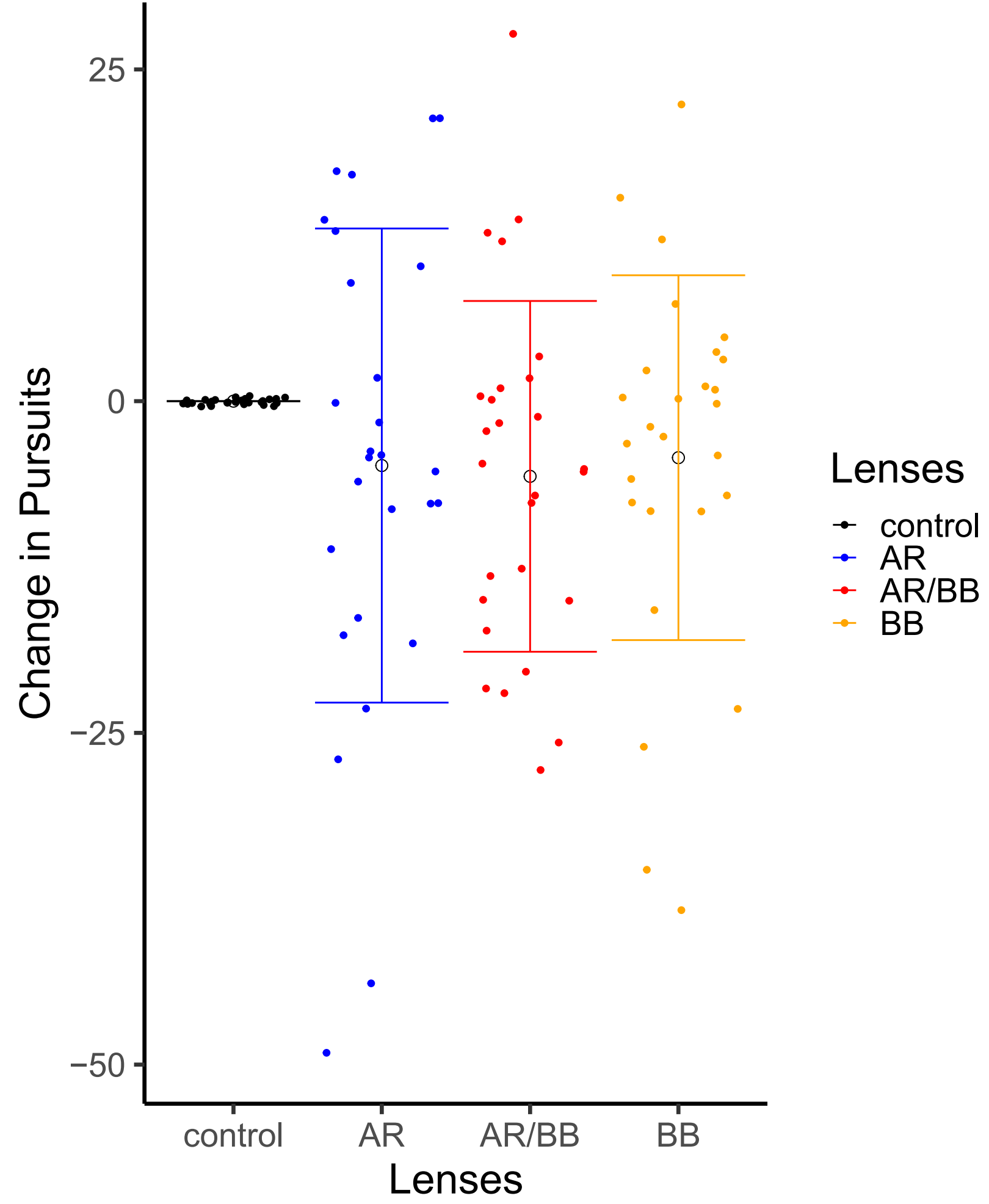


FIGURE 4
Change in Saccades

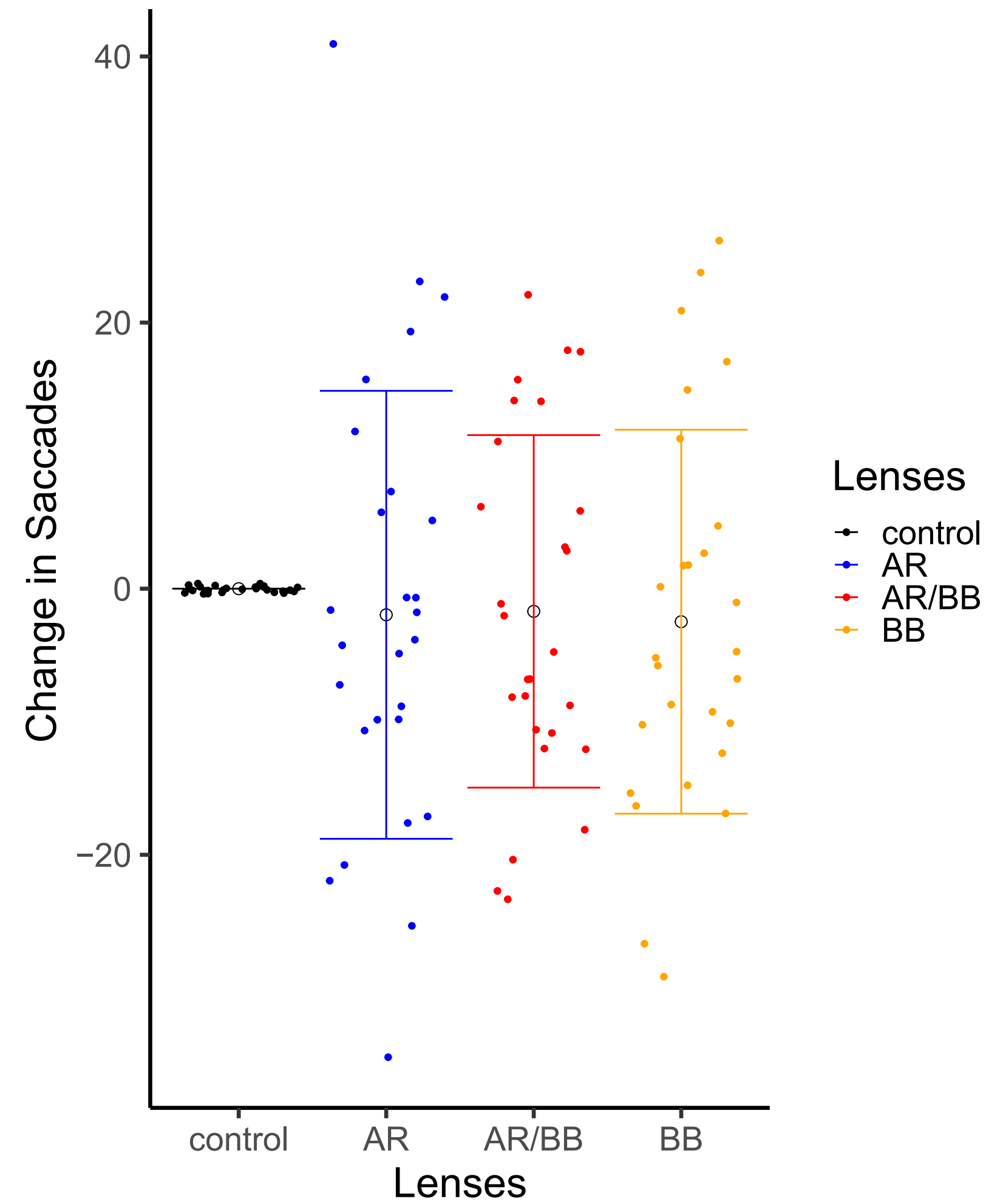
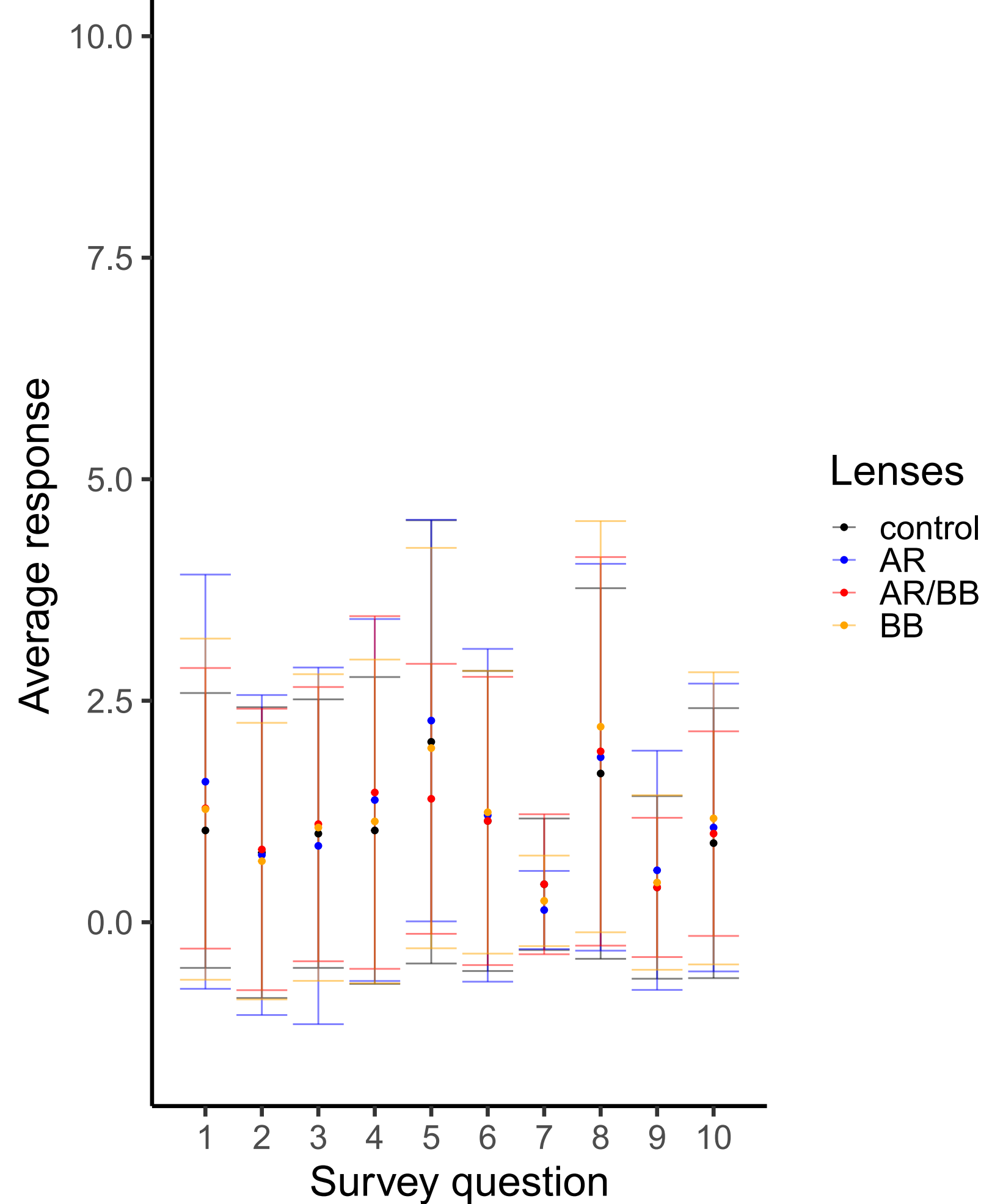


FIGURE 5
Average Survey Response



RESULTS

- See Table 1 and Figure 1-5

DISCUSSION

- These finds are consistent with previous research using eyestrain questionnaires that indicated no reduction in symptomology with a BB filter. However overall symptoms scores were low in this population.
- These findings are not consistent with previous research on reading rate with BB filters however methods differ in control of reading text and filter color.

CONCLUSION

We find no statistical evidence to support claims that BB filters with or without AR coat or with AR coat alone will improve digital eye strain symptoms. This finding is consistent with other studies using the same symptom questionnaire. Additionally, we find no support for these filters and coatings to alter eye movements or change reading rate significantly.

REFERENCES

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