INTRODUCTION

Previous studies have demonstrated tight coordination between pursuit and saccade target selection mechanisms utilizing simple colored stimuli (Krauzlis et al., 1999). The technique of adding noise to stimuli to limit discriminability has been employed to compare decision-making between saccades and perception (Beutter et al., 2000).

We have now used a similar technique and have also limited visual sampling time. This allowed us to directly compare the accuracies of pursuit and saccade decisions during responses that ranged from chance to near perfect.

METHODS

Temporal sequence of trials

We limited the exposure duration during the probe interval to make the period of visual processing identical for each system. Pursuit and saccade movements in the direction of the higher contrast probe were scored as correct using an oculometric decision rule (Kowler and McKee, 1987; Beutter and Stone, 1998).

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Pursuit and saccade performance showed similar improvement as a function of contrast difference. Performance improved as exposure duration increased from 50 to 150 ms, then plateaued.

SUMMARY AND CONCLUSIONS

We conclude that pursuit and saccades have access to similar visual information upon which to base their decisions. However, when relevant visual information is limited, other factors may have a greater influence and can lead to different decisions.

REFERENCES


We measured the proportion of trials on which pursuit and saccadic decisions were the same. We calculated the proportion of same decisions one would expect by chance if pursuit and saccadic decisions were statistically independent. This is given by the equation:

$$P_{ps} = P_1(1 - P_2) + (1 - P_1)P_2$$