

Introduction


Computer Screen Intolerance (CSI):

A syndrome of symptoms induced by exposure to electronic screens.

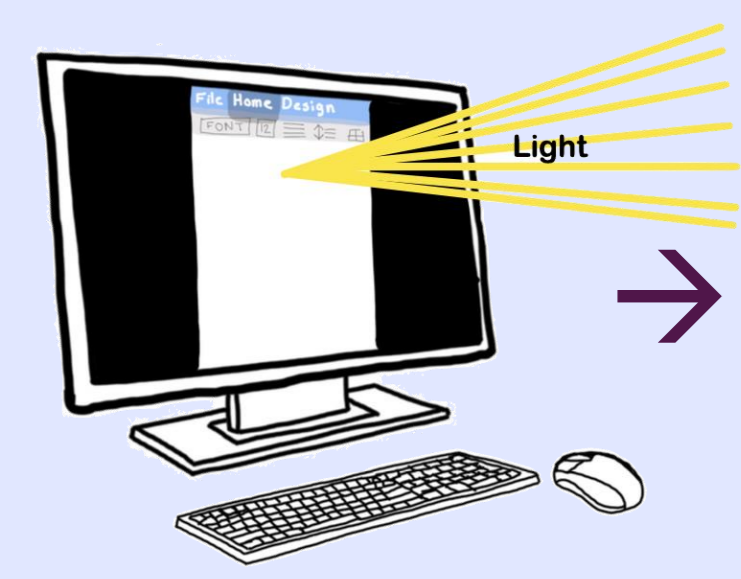
Pupil Light Response (PLR):

The pupil constricts in response to light and dilates in response to darkness.

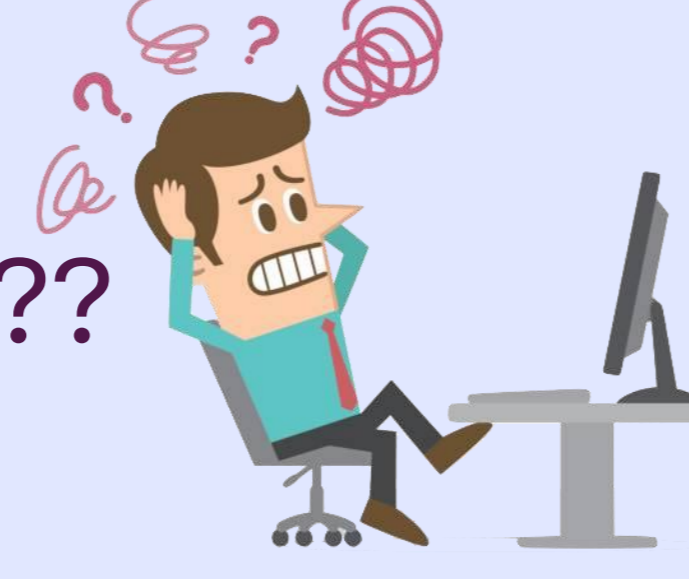
Rod/Cone Driven PLR:

Light → **rhodopsin activation** → phototransduction pathway sends electrical impulses to the  → pupil constriction

Are Intrinsically Photosensitive Retinal Ganglion Cells (ipRGCs) Involved in the Pathophysiology of CSI?



→ **melanopsin activation** → ipRGCs → Thalamus ???



Methods

Study Inclusion and Exclusion Criteria

Concussion Patients

- Concussion within 1 month–5 years
- Persisting concussion symptoms (PCS)
- Computer screen intolerance (CSI)
- Ages 18-65

Healthy Controls

- Ages 18-65

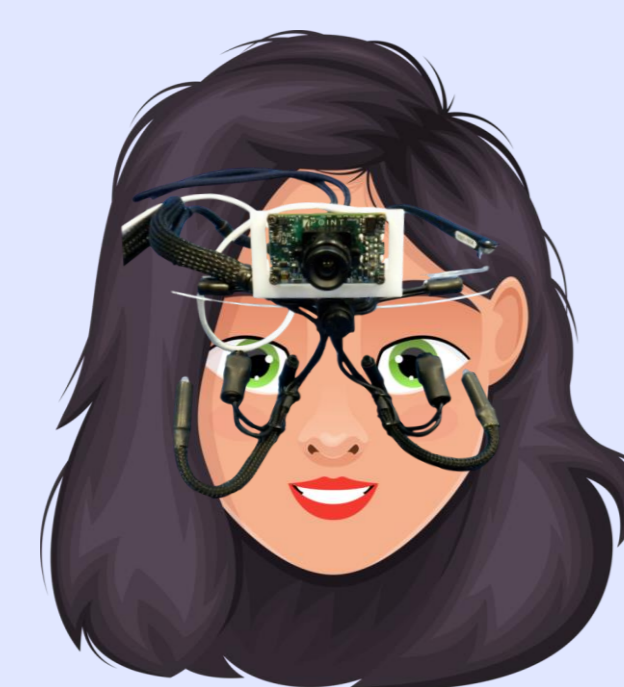
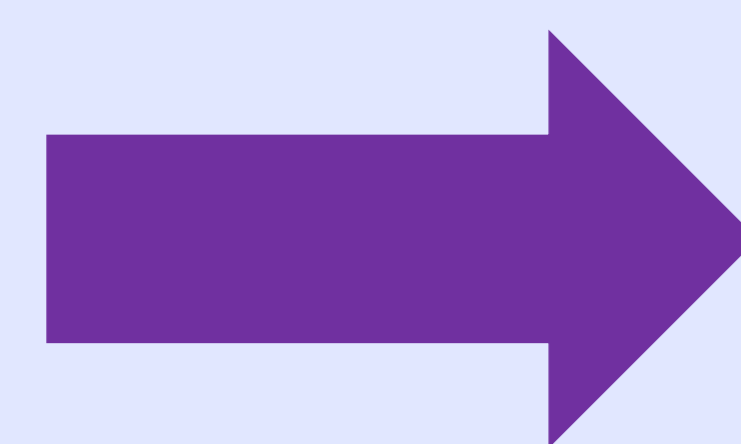
Exclusion

- Neurological conditions more severe than concussion
- Severe psychiatric disorders
- Major pre-existing visual disorders
- Concussion or neurological conditions
- Severe psychiatric disorders
- Major, pre-existing visual disorders

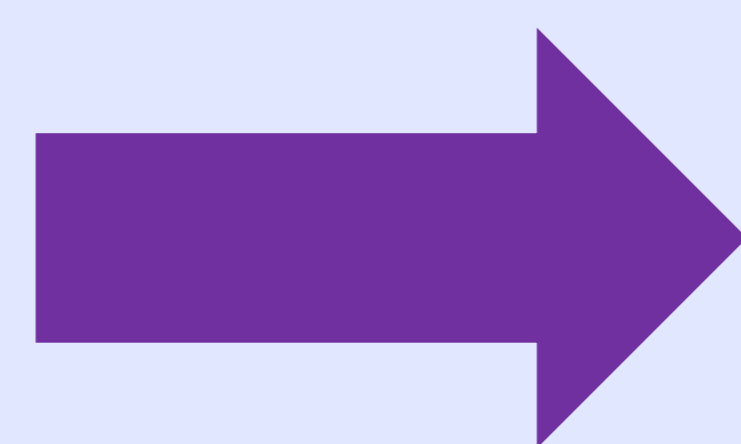
Experimental Design



Study Questionnaires



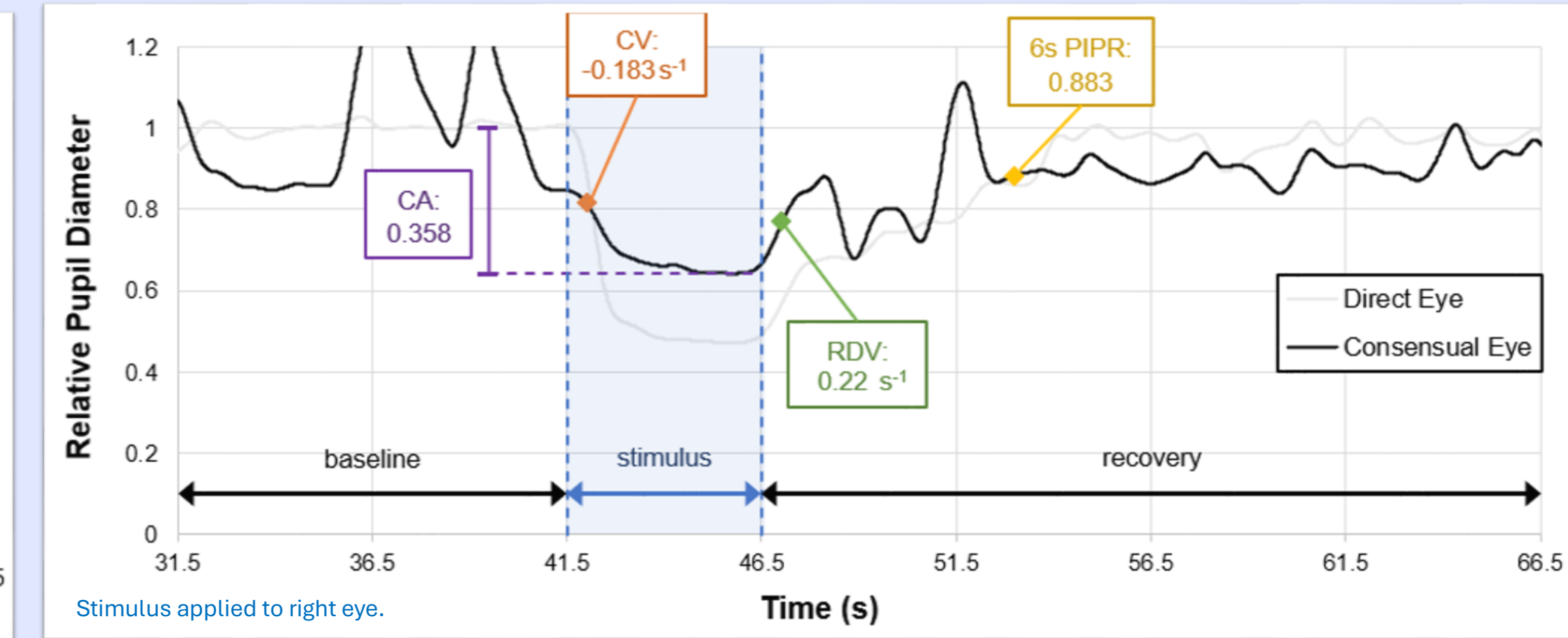
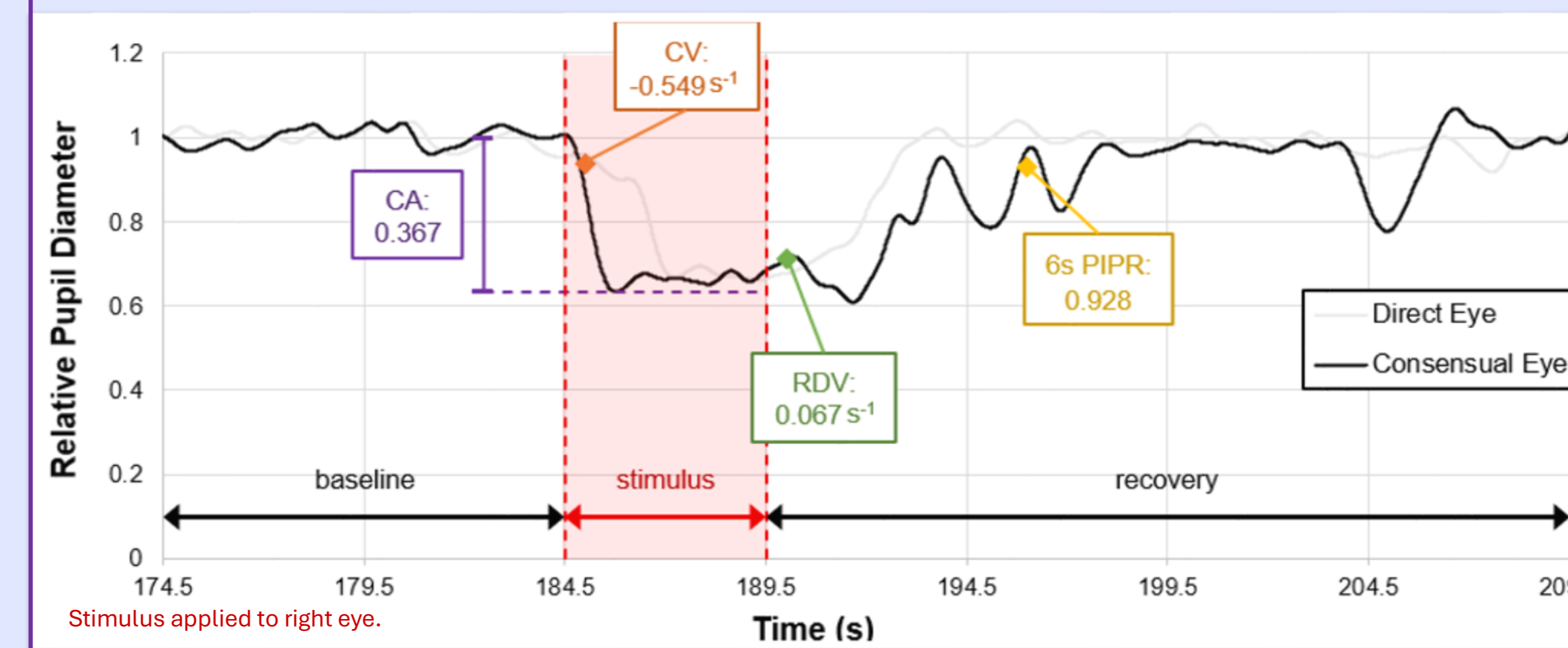
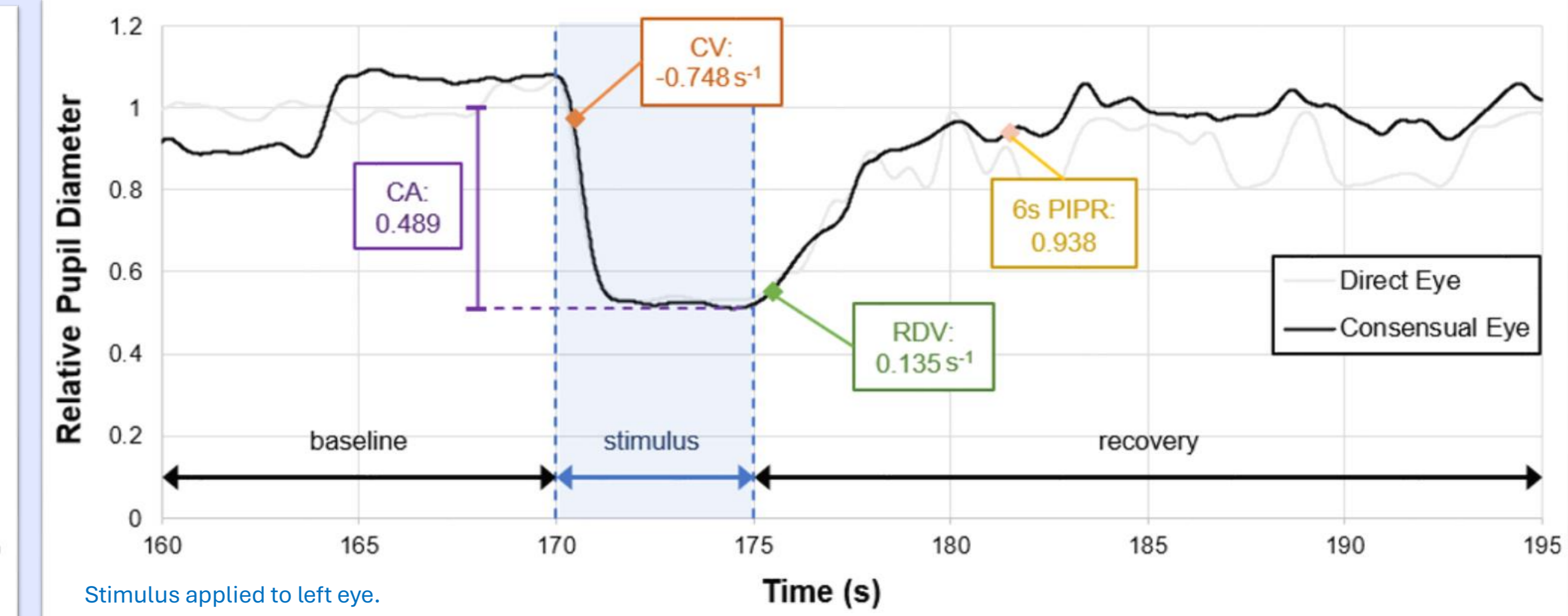
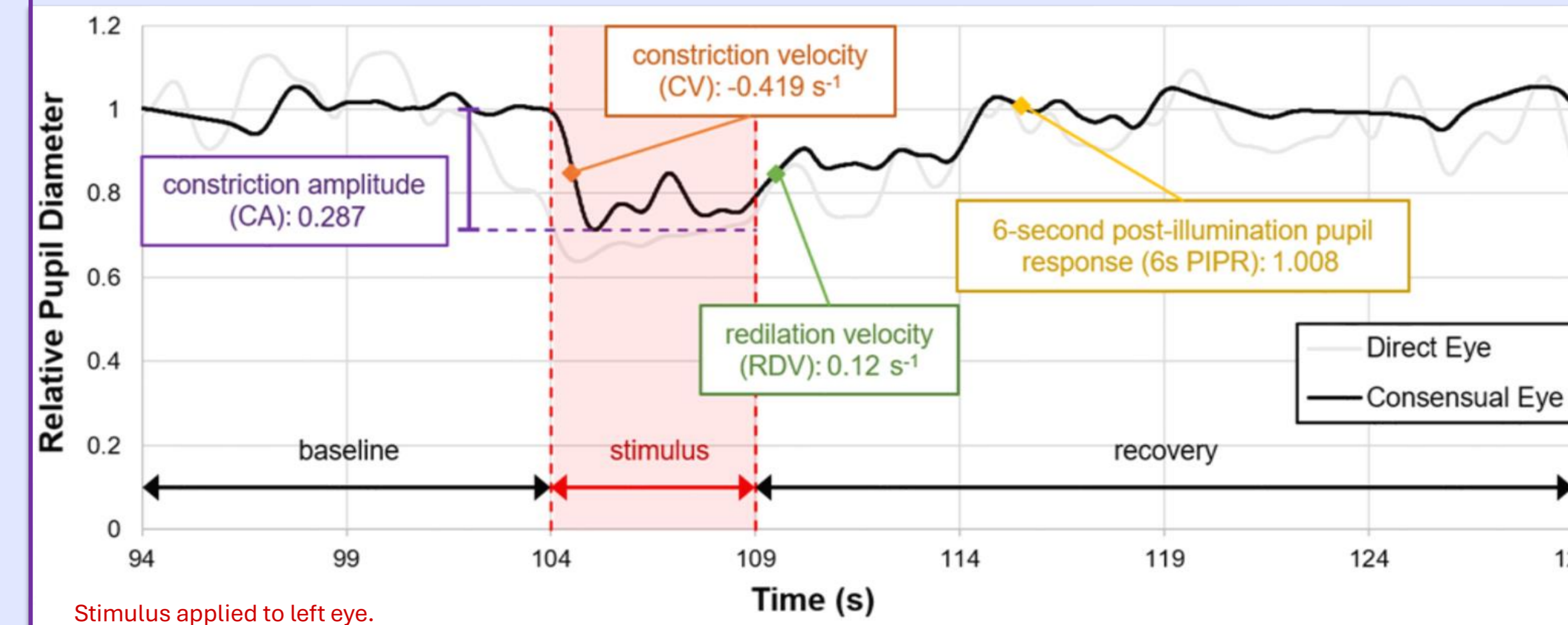
Eye-Tracker Glasses for Pupillometry



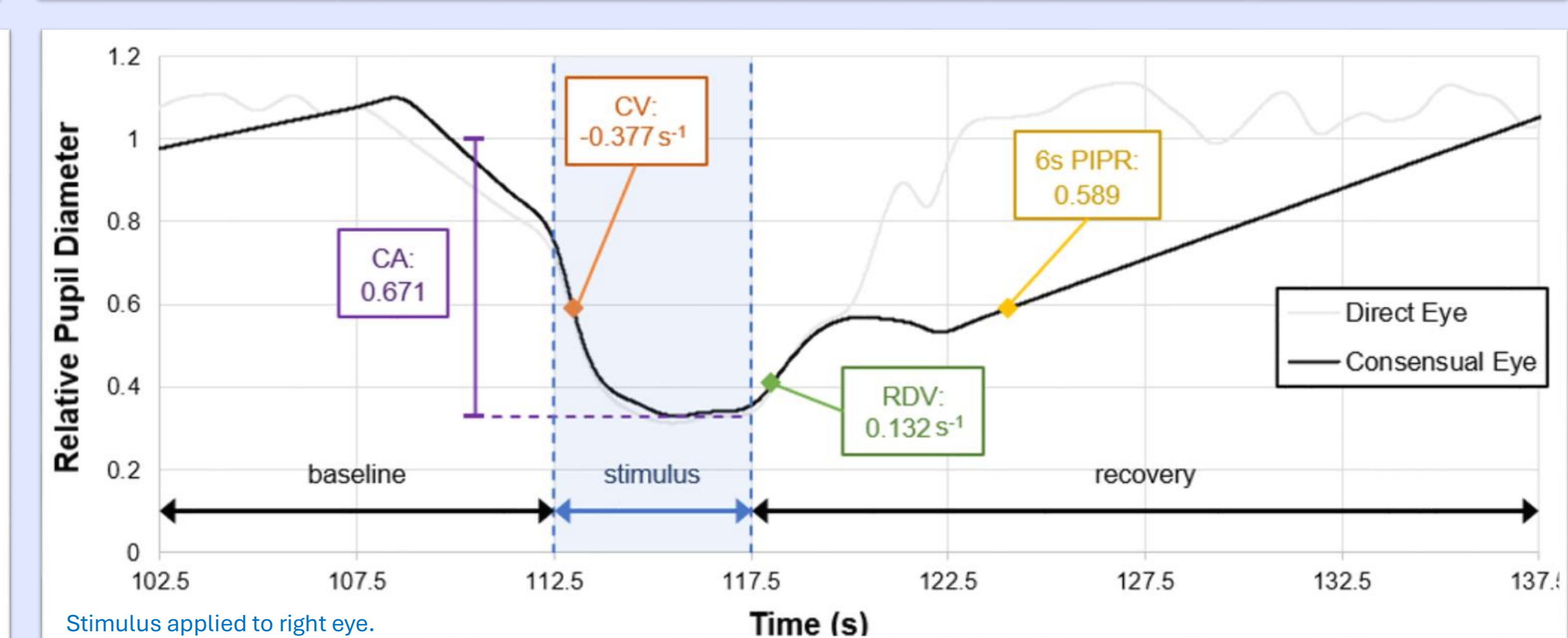
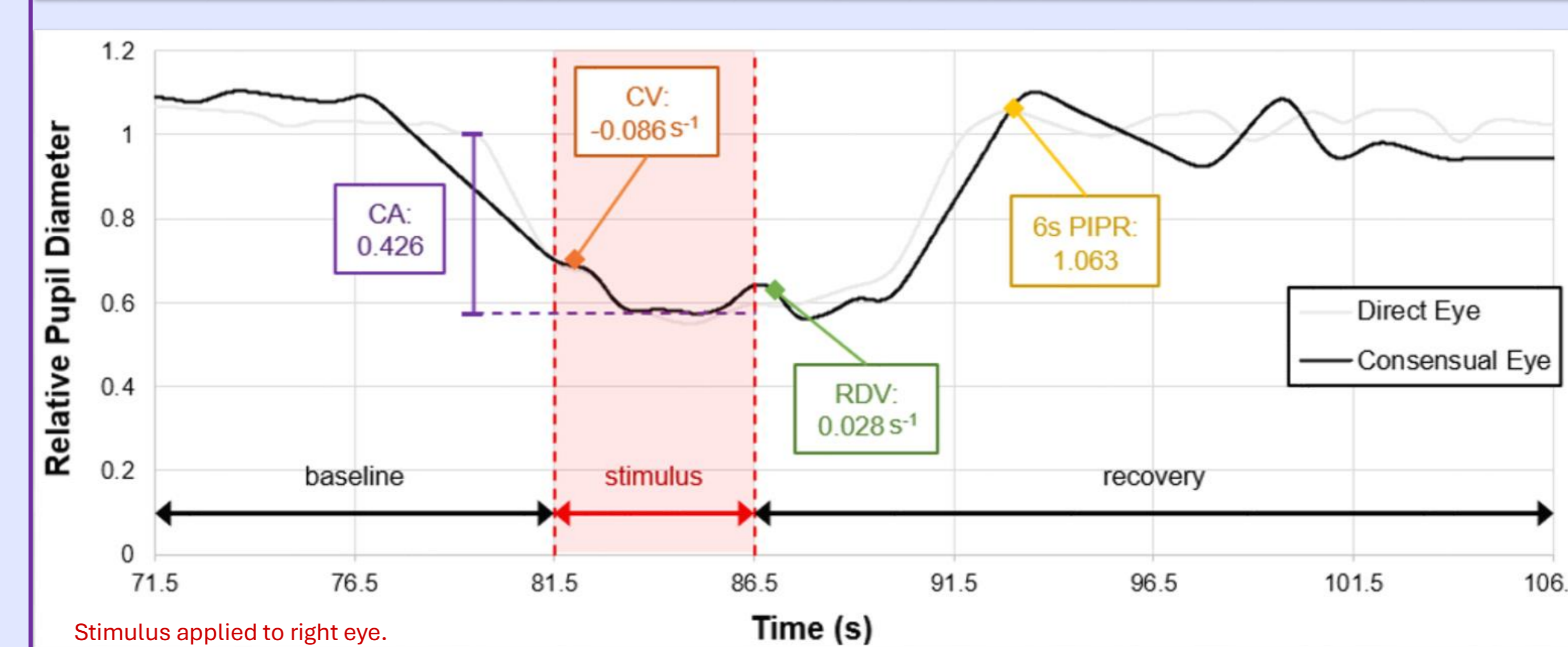
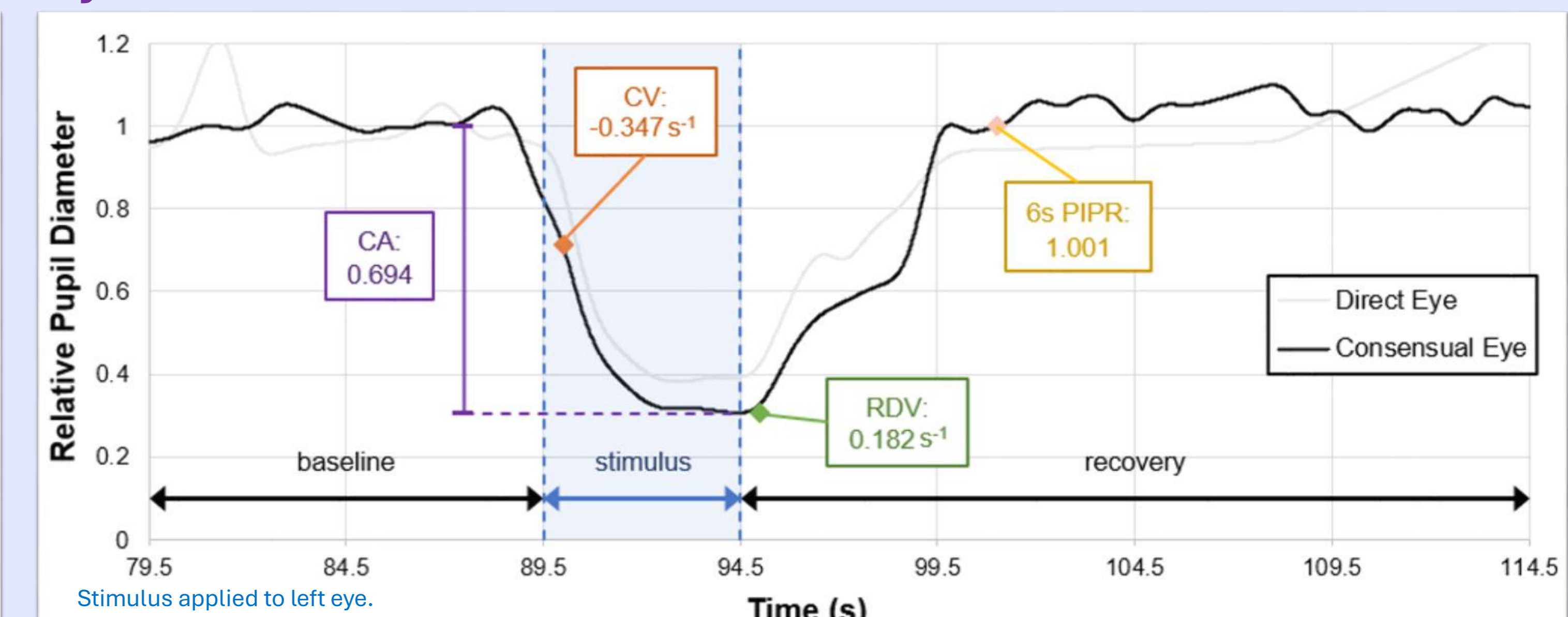
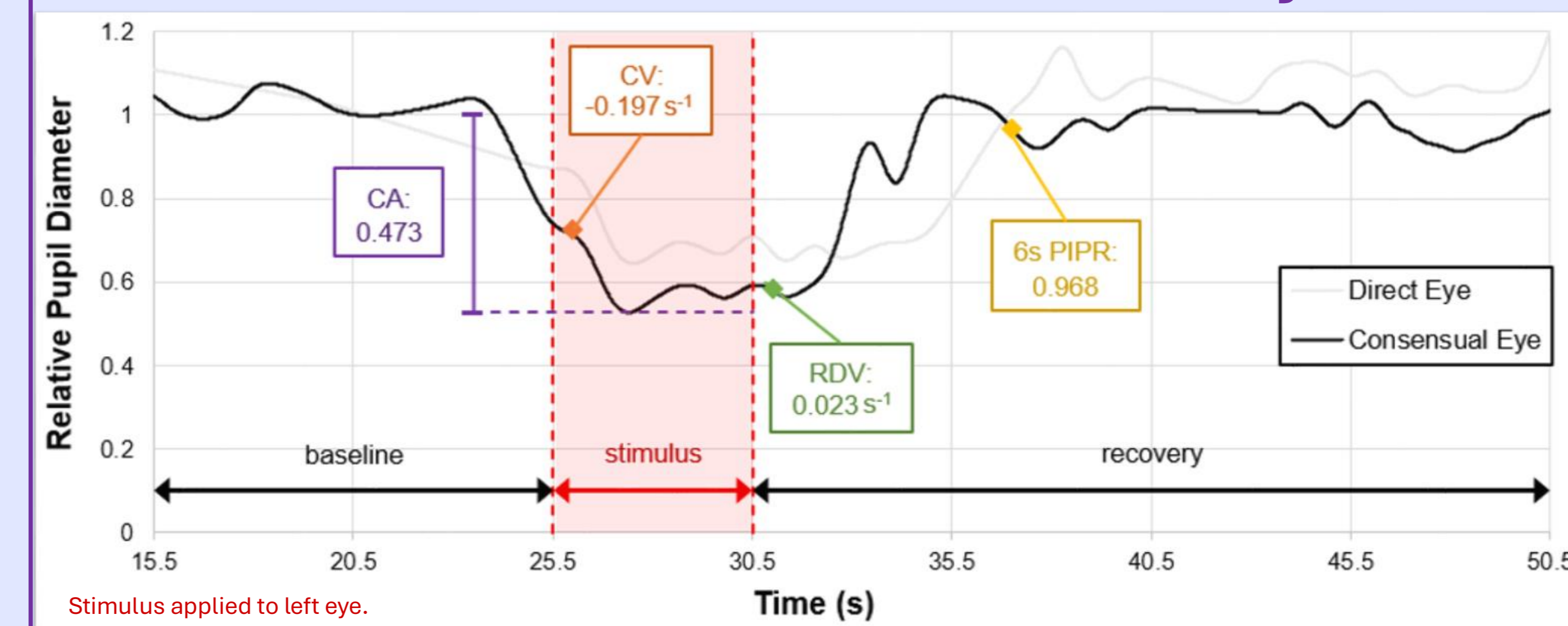
ColorBurst Device: Red Light and Blue Light Stimuli

Preliminary Results: Case Comparison of Pupil Light Response

Concussed Patient with CSI: 22 year-old female, concussion 11 months prior to study.



Healthy Control: 25 year-old female.



Discussion

- The concussed patient showed less constriction, indicating they may have an enlarged pupil diameter, and thus, more light may be entering the pupil. These results are corroborated by findings from Mostafa et al., 2021, in TBI patients using similar methodology.
- We are actively recruiting participants to investigate the involvement of ipRGCs/PLR in the pathophysiology of CSI.