

## **Pupil Dilation Differences When Playing Valorant Under Practice and Competition Conditions: A Case Study**

RYAN SZUCH<sup>1</sup>, CODY S. DULANEY<sup>2</sup>, SERGI G. RETORTILLO<sup>3</sup>, & ANDREAS STAMATIS<sup>2</sup>, FACSM

<sup>1</sup>Adventure Sports & Expeditionary Studies; SUNY Plattsburgh; Plattsburgh, NY

<sup>2</sup>Exercise and Nutrition Sciences; SUNY Plattsburgh; Plattsburgh, NY

<sup>3</sup>Health and Exercise Science; Wake Forest University; Winston-Salem, NC

---

*Category: Undergraduate*

*Advisor / Mentor: Stamatis, Andreas (astam004@plattsburgh.edu)*

### **ABSTRACT**

Esports have been growing faster than any other sport in history. Esports are video games that are played in official competitions and usually fall into a major genre, such as fighting games, real-time strategy, multiplayer online battle arena games, or first-person shooters (FPS). Valorant is an FPS. Advances in technology have now made a new class of information, namely biofeedback, readily available. An example of biofeedback is pupil size, which is an indirect measure of the amount of material under active processing and sympathetic/parasympathetic activity. Eye behavior is considered crucial in FPS games. Relevant research is scarce in this specific esports genre. Skills learned during practice should transfer to real-game environments. **PURPOSE:** To investigate differences in pupil size between practice and competition sessions of Valorant. **METHODS:** A 21-year-old collegiate esports player, ranked Diamond 1 (top 12%), recorded a practice session and, then, a game of Valorant on the same day. Each session lasted about 65 minutes. Valorant is a 5v5 character-based tactical FPS game. Data was collected via Curia software using LabStreamingLayer to stream data from a Tobii 5L eye tracker into LSL native XDF format, retaining timestamping and synchronization information. Due to having one participant, significance was investigated graphically. **RESULTS:** On average, the pupil size during practice was 5.1mm and during game 5.3mm. When comparing the mean pupil diameter of both eyes between sessions using violin and scatterplot graphs, it was observed that the distribution of the pupil sizes in the game was shifted higher than during the practice session. **CONCLUSION:** Our findings indicate higher cognitive load and sympathetic innervation/parasympathetic withdrawal during competition versus practice conditions. Implications for evidence-based practice include replication of load during practice to accomplish game-like conditions, and therefore, facilitate optimal learning and development of expertise. The significance of these findings increases as this form of augmented feedback can be available to the athlete and the coach in real time. Future research should consider examining fixation stability/location, the relationship of pupil dilation with HRV and using longitudinal designs and larger samples.