The use of facial characteristics in birds has been well documented in previous studies. Bill color has been found to reduce glare in birds residing in open habitats (Williams & Burtt, 2010), a study on the Common Yellowthroat showed that the melanin based ornament they feature was used for both female attraction and male-male competition (Thusius et al., 2001), and that the loss or gain of facial stripes have been shown to be related to the environment the bird lives in (Ortolani 1999). This study focuses on using pairwise comparison (Maddison 2000) to determine the selection pressure of various species within the families Falconidae, Paridae, Tyrannidae, and Parulidae. The pressures tested for were glare reduction, sexual selection, and individual recognition through use of a melanin-based facial stripe.

**Methods:**
The Handbook of the Birds of the World was used to determine facial stripe Once facial stripe was determined, habitat preference, dimorphism, and diet were recorded into a Mesquite data matrix
The Maddison Test was run on each family to detect character associations Those tests showing low tail probabilities were considered significant

**Results:**
The Probability results of the four families are represented in Table 1. With the lowest numbers representing the most significant selection pressure. Those highlighted in purple represent the most supported use of the facial stripe in the family. Refer to Figure 1. for the mirror tree used to test glare reduction in the Falconidae family. The “X” represents no mirror found to use stripe for that selection pressure.

![Figure 1. Falconidae pairwise comparison of glare reduction](image)

**Table 1. Significance values for avian families selection pressures**

<table>
<thead>
<tr>
<th>Avian Family</th>
<th>Glare Reduction</th>
<th>Sexual Selection</th>
<th>Social Recognition</th>
</tr>
</thead>
<tbody>
<tr>
<td>Falconidae</td>
<td>4.88x10^-4</td>
<td>X</td>
<td>X</td>
</tr>
<tr>
<td>Paridae</td>
<td>6.25x10^-2</td>
<td>6.25x10^-2</td>
<td>3.13x10^-2</td>
</tr>
<tr>
<td>Tyrannidae</td>
<td>4.80x10^-7</td>
<td>3.13x10^-2</td>
<td>2.50x10^-1</td>
</tr>
<tr>
<td>Parulidae</td>
<td>1.95x10^-3</td>
<td>7.45x10^-9</td>
<td>X</td>
</tr>
</tbody>
</table>

**Discussion:**
The facial stripe in birds is found to support the needs of individual species through various selection pressures; be it glare reduction, sexual selection, or social recognition.

**Conclusion:**
In conclusion, this study suggest that many aerial predators such as falcons or flycatchers use a facial stripe for glare reduction; in particular, a melanin-based stripe that goes just through the eye. In other cases, such as warblers, the stripe is used for sexual selection. A few species have even been noted as using the stripe for individual recognition. More research is suggested to confirm the idea of a facial stripe being used for recognition.

**References:**


