systemic lupus erythematosus (SLE) is a chronic, inflammatory autoimmune disease that can affect any system in the body, including the central nervous system.1 People with SLE have noted cognitive deficits, such as deficits in working memory, executive function, and inhibition, although there is disagreement in the field about what cognitive symptoms are most and routinely impacted by disease activity.2,3,4 Sunlight exposure can cause exacerbation in disease symptoms and activity in people with SLE.5,6 Our previous work has demonstrated that sunlight exposure worsens physical and cognitive symptoms in people with SLE as well as worsens performance on tasks of inhibition in the summer months.7

Hypotheses
- Increased sunlight exposure will negatively impact patients’ experience of both cognitive and physical symptoms.
- Increased sunlight exposure will negatively impact patient’s performance on tasks of inhibition.

In our full study, we surveyed 6 participants, 4 of which self-reported being diagnosed with SLE. Participants completed daily surveys for ten weeks, including surveys of physical and cognitive symptoms, and also completed several inhibitory tasks, including the Stroop test, the go/no go paradigm, and the Flanker test. Participants also self-reported the number of minutes they had been exposed to sunlight on a given day, with sunlight exposure being defined as any outdoor exposure to the sun during daytime hours, even when there is significant cloud coverage. We also asked participants to report sunlight exposure when they were near open windows, doors, or driving in the car. In this presentation, we are focusing on the differences between Summer 2018 and Winter 2019 data for one participant that participated in both studies. The method between the two studies are identical. The participant we are focusing on is diagnosed with SLE and is 21 years of age.

Results

<table>
<thead>
<tr>
<th>Summer 2018</th>
<th>Winter 2019</th>
</tr>
</thead>
<tbody>
<tr>
<td>![Graph 1]</td>
<td>![Graph 2]</td>
</tr>
<tr>
<td>![Graph 3]</td>
<td>![Graph 4]</td>
</tr>
</tbody>
</table>

Using a one-way ANOVA, we determined that there were statistically significant differences between our two datasets, including differences between total cognitive symptoms reported ($F = 113.336, p < .001$), total physical symptoms reported ($F = 88.250, p < .001$), and the total amount of sunlight exposure ($F = 85.240, p < .001$). Differences in Stroop task score failed to reach significance ($F = .886, p = .349$). We additionally found significant differences between specific physical and cognitive symptoms.

References