Table 1: Test for variance among families and populations

Model: Monarch\_Quantity\_Observed ~ Block + (1 | Population) + (1 | Population:Fam\_uniq)

| Variable | Group | Variance | PVE | p |
| --- | --- | --- | --- | --- |
| Monarch butterfly: 2020 | Family | 0.024 | 1.618 | 0.1835 |
| Population | 0.054 | 3.586 | 0.2965 |

Table 2: Assess how much variance is explained by urbanization

Urbanization = Distance to the City Center

Model: Monarch\_Quantity\_Observed ~ Block + (1 | Population) + (1 | Population:Fam\_uniq) + City\_dist

| Variable | Group | Variance | PVE | p |
| --- | --- | --- | --- | --- |
| Monarch butterfly: 2020 | Family | 0.023 | 1.588 | 0.1825 |
| Population | 0.053 | 3.531 | 0.311 |

Table 3: Quantify variance explained by urbanization

| Variable | Predictor | χ2 | p |
| --- | --- | --- | --- |
| Monarch butterfly: 2020 | Block | 13.718 | **0.003\*\*** |
| Distance to City Center | 0.306 | 0.58 |

Table 4: Assess how much variance is explained by urbanization

Urbanization = Urbanization Score

Model: Monarch\_Quantity\_Observed ~ Block + (1 | Population) + (1 | Population:Fam\_uniq) + Urb\_score

| Variable | Group | Variance | PVE | p |
| --- | --- | --- | --- | --- |
| Monarch butterfly: 2020 | Family | 0.022 | 1.512 | 0.1815 |
| Population | 0.052 | 3.458 | 0.3275 |

Table 5: Quantify variance explained by urbanization

| Variable | Predictor | χ2 | p |
| --- | --- | --- | --- |
| Monarch butterfly: 2020 | Block | 13.690 | **0.003\*\*** |
| Urbanization Score | 0.653 | 0.419 |