

$$\begin{aligned}
m_0: \text{ActEffort} &\sim \text{GammaPoisson}(\lambda, \phi) \\
\log(\lambda) &= \alpha \\
\phi &\sim \text{Exponential}(1) \\
\alpha &\sim \text{Normal}(0,2)
\end{aligned}$$

$$\begin{aligned}
m_1: \text{ActEffort}_i &\sim \text{GammaPoisson}(\lambda_i, \phi) \\
\log(\lambda_i) &= \alpha_{\text{Cplx}} \times \text{Cplx}_i \\
\phi &\sim \text{Exponential}(1) \\
\alpha_{\text{Cplx}} &\sim \text{Normal}(0,2.5)
\end{aligned}$$

$$\begin{aligned}
m_2: \text{ActEffort}_i &\sim \text{GammaPoisson}(\lambda_i, \phi) \\
\log(\lambda_i) &= \alpha_{\text{Acap}} \times \text{Acap}_i \\
\phi &\sim \text{Exponential}(1) \\
\alpha_{\text{Acap}} &\sim \text{Normal}(0,2.5)
\end{aligned}$$

$$\begin{aligned}
m_3: \text{ActEffort}_i &\sim \text{GammaPoisson}(\lambda_i, \phi) \\
\log(\lambda_i) &= \alpha_{\text{Pcap}} \times \text{Pcap}_i \\
\phi &\sim \text{Exponential}(1) \\
\alpha_{\text{Pcap}} &\sim \text{Normal}(0,2.5)
\end{aligned}$$

$$\begin{aligned}
m_4: \text{ActEffort}_i &\sim \text{Exponential}(\lambda_i) \\
\lambda_i &= \alpha + \beta_{\text{Cplx}} \text{Cplx}_i + \beta_{\text{acap}} \text{Acap}_i \\
&\quad + \beta_{\text{Pcap}} \text{Pcap}_i \\
\alpha &\sim \text{Normal}(0, 0.5) \\
\beta_{\text{Cplx}} &\sim \text{Normal}(0,1) \\
\beta_{\text{Acap}} &\sim \text{Normal}(0,1) \\
\beta_{\text{Pcap}} &\sim \text{Normal}(0,1)
\end{aligned}$$

```
> precis(m0, depth = 2)
```

|              | mean | sd   | 5.5% | 94.5% | n_eff | Rhat4 |
|--------------|------|------|------|-------|-------|-------|
| <b>phi</b>   | 0.61 | 0.07 | 0.49 | 0.73  | 1373  | 1     |
| <b>alpha</b> | 6.42 | 0.14 | 6.20 | 6.64  | 1166  | 1     |

  

```
> precis(m2, depth = 2)
```

|                  | mean | sd   | 5.5% | 94.5% | n_eff | Rhat4 |
|------------------|------|------|------|-------|-------|-------|
| <b>phi</b>       | 0.66 | 0.08 | 0.54 | 0.80  | 1803  | 1     |
| <b>a_acap[1]</b> | 6.76 | 0.17 | 6.49 | 7.04  | 2127  | 1     |
| <b>a_acap[2]</b> | 5.68 | 0.21 | 5.36 | 6.01  | 2241  | 1     |
| <b>a_acap[3]</b> | 5.86 | 0.37 | 5.31 | 6.50  | 2124  | 1     |

```
> precis(m1, depth = 2)
```

|                  | mean | sd   | 5.5% | 94.5% | n_eff | Rhat4 |
|------------------|------|------|------|-------|-------|-------|
| <b>phi</b>       | 0.73 | 0.09 | 0.60 | 0.89  | 2577  | 1     |
| <b>a_cplx[1]</b> | 5.75 | 0.16 | 5.50 | 6.00  | 2375  | 1     |
| <b>a_cplx[2]</b> | 6.51 | 0.59 | 5.66 | 7.49  | 1657  | 1     |
| <b>a_cplx[3]</b> | 6.13 | 0.35 | 5.61 | 6.72  | 2187  | 1     |
| <b>a_cplx[4]</b> | 7.15 | 0.28 | 6.75 | 7.60  | 2572  | 1     |
| <b>a_cplx[5]</b> | 7.36 | 0.47 | 6.66 | 8.16  | 3040  | 1     |

  

```
> precis(m3, depth = 2)
```

|                  | mean | sd   | 5.5% | 94.5% | n_eff | Rhat4 |
|------------------|------|------|------|-------|-------|-------|
| <b>phi</b>       | 0.65 | 0.08 | 0.53 | 0.79  | 2290  | 1     |
| <b>a_pcap[1]</b> | 6.80 | 0.19 | 6.50 | 7.11  | 2447  | 1     |
| <b>a_pcap[2]</b> | 5.84 | 0.20 | 5.53 | 6.16  | 2586  | 1     |
| <b>a_pcap[3]</b> | 6.43 | 0.37 | 5.87 | 7.06  | 2406  | 1     |

|           | PSIS   | SE    | dPSIS | dSE   | pPSIS | weight |
|-----------|--------|-------|-------|-------|-------|--------|
| <b>m1</b> | 1348.3 | 31.71 | 0.0   | NA    | 7.1   | 1      |
| <b>m2</b> | 1359.6 | 32.67 | 11.3  | 9.41  | 5.3   | 0      |
| <b>m3</b> | 1361.7 | 31.39 | 13.4  | 12.05 | 5.1   | 0      |
| <b>m0</b> | 1369.3 | 32.21 | 21.1  | 13.06 | 3.1   | 0      |