

## Appendix

### Supplementary tables of parameter estimates

The observed data (continuous variables only) were standardised to mean zero and standard deviation of unity prior to any model fitting. This is common practice in Bayesian inference and model selection as it enables easier and more reliable numerical estimation of the parameters in the model while having no effect on the level of statistical support for model features (c.f. in a classical - non-Bayesian - regression analysis the p-values obtained are unaffected by this standardisation of the data).

#### Parameters in Figure 1 (a): Response $g_5$

| Node  | Arc                   | Median & 95% CI      | Node     | Arc                      | Median & 95% CI      |
|-------|-----------------------|----------------------|----------|--------------------------|----------------------|
| $b_2$ | Intercept             | -1.27 (-1.50, -1.05) | $g_5$    | $g_{10} \rightarrow g_5$ | -0.30 (-0.38, -0.21) |
| $b_3$ | Intercept             | -0.91 (-1.12, -0.71) | $g_5$    | precision                | 1.26 (1.10, 1.44)    |
| $b_4$ | Intercept             | -2.61 (-3.00, -2.25) | $g_6$    | Intercept                | 0.00 (-0.09, 0.09)   |
| $b_5$ | Intercept             | -0.13 (-0.32, 0.04)  | $g_6$    | precision                | 1.00 (0.87, 1.14)    |
| $b_6$ | Intercept             | -1.91 (-2.20, -1.64) | $g_7$    | Intercept                | 0.00 (-0.09, 0.09)   |
| $g_1$ | Intercept             | 0.00 (-0.09, 0.09)   | $g_7$    | precision                | 1.00 (0.87, 1.14)    |
| $g_1$ | precision             | 1.00 (0.87, 1.14)    | $g_8$    | Intercept                | 0.00 (-0.09, 0.09)   |
| $g_2$ | Intercept             | 0.00 (-0.09, 0.09)   | $g_8$    | precision                | 1.00 (0.87, 1.14)    |
| $g_2$ | precision             | 1.00 (0.87, 1.14)    | $g_9$    | Intercept                | 0.00 (-0.09, 0.09)   |
| $g_3$ | Intercept             | 0.00 (-0.09, 0.09)   | $g_9$    | precision                | 1.00 (0.87, 1.14)    |
| $g_3$ | precision             | 1.00 (0.87, 1.14)    | $g_{10}$ | Intercept                | 0.00 (-0.09, 0.09)   |
| $g_4$ | Intercept             | 0.00 (-0.09, 0.09)   | $g_{10}$ | precision                | 1.00 (0.87, 1.14)    |
| $g_4$ | precision             | 1.00 (0.87, 1.14)    | $g_{11}$ | Intercept                | 0.00 (-0.09, 0.09)   |
| $g_5$ | Intercept             | -0.16 (-0.27, -0.06) | $g_{11}$ | precision                | 1.00 (0.87, 1.14)    |
| $g_5$ | $b_3 \rightarrow g_5$ | 0.34 (0.15, 0.52)    | $g_{12}$ | Intercept                | 0.00 (-0.09, 0.09)   |
| $g_5$ | $b_6 \rightarrow g_5$ | 0.52 (0.27, 0.77)    | $g_{12}$ | precision                | 1.00 (0.87, 1.14)    |
| $g_5$ | $g_9 \rightarrow g_5$ | 0.21 (0.12, 0.29)    |          |                          |                      |

**Parameters in Figure 2 (a): Response  $g_2$**

| Node  | Arc                   | Median & 95% CI      | Node     | Arc       | Median & 95% CI    |
|-------|-----------------------|----------------------|----------|-----------|--------------------|
| $b_2$ | Intercept             | -1.27 (-1.50, -1.05) | $g_5$    | precision | 1.00 (0.87, 1.14)  |
| $b_3$ | Intercept             | -0.91 (-1.12, -0.71) | $g_6$    | Intercept | 0.00 (-0.09, 0.09) |
| $b_4$ | Intercept             | -2.61 (-3.00, -2.25) | $g_6$    | precision | 1.00 (0.87, 1.14)  |
| $b_5$ | Intercept             | -0.13 (-0.32, 0.04)  | $g_7$    | Intercept | 0.00 (-0.09, 0.09) |
| $b_6$ | Intercept             | -1.91 (-2.20, -1.64) | $g_7$    | precision | 1.00 (0.87, 1.14)  |
| $g_1$ | Intercept             | 0.00 (-0.09, 0.09)   | $g_8$    | Intercept | 0.00 (-0.09, 0.09) |
| $g_1$ | precision             | 1.00 (0.87, 1.14)    | $g_8$    | precision | 1.00 (0.87, 1.14)  |
| $g_2$ | Intercept             | 0.03 (-0.02, 0.10)   | $g_9$    | Intercept | 0.00 (-0.09, 0.09) |
| $g_2$ | $b_4 \rightarrow g_2$ | -0.52 (-0.77, -0.27) | $g_9$    | precision | 1.00 (0.87, 1.14)  |
| $g_2$ | $g_3 \rightarrow g_2$ | 0.73 (0.66, 0.79)    | $g_{10}$ | Intercept | 0.00 (-0.09, 0.09) |
| $g_2$ | precision             | 2.23 (1.95, 2.54)    | $g_{10}$ | precision | 1.00 (0.87, 1.14)  |
| $g_3$ | Intercept             | 0.00 (-0.09, 0.09)   | $g_{11}$ | Intercept | 0.00 (-0.09, 0.09) |
| $g_3$ | precision             | 1.00 (0.87, 1.14)    | $g_{11}$ | precision | 1.00 (0.87, 1.14)  |
| $g_4$ | Intercept             | 0.00 (-0.09, 0.09)   | $g_{12}$ | Intercept | 0.00 (-0.09, 0.09) |
| $g_4$ | precision             | 1.00 (0.87, 1.14)    | $g_{12}$ | precision | 1.00 (0.87, 1.14)  |
| $g_5$ | Intercept             | 0.00 (-0.09, 0.09)   |          |           |                    |

**Parameters in Figure 3 (a): Response  $b_3$**

| Node  | Arc                   | Median & 95% CI      | Node     | Arc       | Median & 95% CI    |
|-------|-----------------------|----------------------|----------|-----------|--------------------|
| $b_2$ | Intercept             | -1.27 (-1.50, -1.05) | $g_5$    | Intercept | 0.00 (-0.09, 0.09) |
| $b_3$ | Intercept             | -1.18 (-1.43, -0.94) | $g_5$    | precision | 1.00 (0.87, 1.14)  |
| $b_3$ | $b_4 \rightarrow b_3$ | 2.22 (1.35, 3.22)    | $g_6$    | Intercept | 0.00 (-0.09, 0.09) |
| $b_3$ | $g_7 \rightarrow b_3$ | 0.61 (0.35, 0.89)    | $g_6$    | precision | 1.00 (0.87, 1.14)  |
| $b_3$ | $g_8 \rightarrow b_3$ | -0.48 (-0.75, -0.23) | $g_7$    | Intercept | 0.00 (-0.09, 0.09) |
| $b_4$ | Intercept             | -2.61 (-3.00, -2.25) | $g_7$    | precision | 1.00 (0.87, 1.14)  |
| $b_5$ | Intercept             | -0.13 (-0.32, 0.04)  | $g_8$    | Intercept | 0.00 (-0.09, 0.09) |
| $b_6$ | Intercept             | -1.91 (-2.20, -1.64) | $g_8$    | precision | 1.00 (0.87, 1.14)  |
| $g_1$ | Intercept             | 0.00 (-0.09, 0.09)   | $g_9$    | Intercept | 0.00 (-0.09, 0.09) |
| $g_1$ | precision             | 1.00 (0.87, 1.14)    | $g_9$    | precision | 1.00 (0.87, 1.14)  |
| $g_2$ | Intercept             | 0.00 (-0.09, 0.09)   | $g_{10}$ | Intercept | 0.00 (-0.09, 0.09) |
| $g_2$ | precision             | 1.00 (0.87, 1.14)    | $g_{10}$ | precision | 1.00 (0.87, 1.14)  |
| $g_3$ | Intercept             | 0.00 (-0.09, 0.09)   | $g_{11}$ | Intercept | 0.00 (-0.09, 0.09) |
| $g_3$ | precision             | 1.00 (0.87, 1.14)    | $g_{11}$ | precision | 1.00 (0.87, 1.14)  |
| $g_4$ | Intercept             | 0.00 (-0.09, 0.09)   | $g_{12}$ | Intercept | 0.00 (-0.09, 0.09) |
| $g_4$ | precision             | 1.00 (0.87, 1.14)    | $g_{12}$ | precision | 1.00 (0.87, 1.14)  |

**Parameters in Figure 1/2/3 (b): Full BN model**

| Node      | Arc                   | Median & 95% CI |                 | Node       | Arc                    | Median & 95% CI |                |
|-----------|-----------------------|-----------------|-----------------|------------|------------------------|-----------------|----------------|
| <i>b2</i> | Intercept             | -1.37           | (-1.63, -1.13)  | <i>g5</i>  | <i>b3</i> → <i>g5</i>  | 0.38            | (0.19, 0.58)   |
| <i>b2</i> | <i>g6</i> → <i>b2</i> | -0.60           | (-0.89, -0.33)  | <i>g5</i>  | <i>b6</i> → <i>g5</i>  | 0.50            | (0.24, 0.76)   |
| <i>b3</i> | Intercept             | -0.99           | (-1.22, -0.77)  | <i>g5</i>  | <i>g9</i> → <i>g5</i>  | 0.25            | (0.16, 0.34)   |
| <i>b3</i> | <i>g8</i> → <i>b3</i> | -0.61           | (-0.87, -0.36)  | <i>g5</i>  | precision              | 1.14            | (0.99, 1.30)   |
| <i>b4</i> | Intercept             | -5.91           | (-7.55, -4.64)  | <i>g6</i>  | Intercept              | 0.00            | (-0.08, 0.08 ) |
| <i>b4</i> | <i>b3</i> → <i>b4</i> | 2.74            | (1.78, 3.84)    | <i>g6</i>  | <i>g1</i> → <i>g6</i>  | 0.24            | (0.16, 0.32)   |
| <i>b4</i> | <i>g6</i> → <i>b4</i> | -2.11           | (-3.09, -1.29)  | <i>g6</i>  | <i>g11</i> → <i>g6</i> | -0.41           | (-0.49, -0.33) |
| <i>b4</i> | <i>g9</i> → <i>b4</i> | -1.46           | (-2.50, -0.59)  | <i>g6</i>  | <i>g12</i> → <i>g6</i> | 0.15            | (0.07, 0.24)   |
| <i>b5</i> | Intercept             | -0.13           | (-0.32, 0.05)   | <i>g6</i>  | precision              | 1.34            | (1.17, 1.53)   |
| <i>b5</i> | <i>g5</i> → <i>b5</i> | 0.42            | (0.20, 0.65)    | <i>g7</i>  | Intercept              | -0.15           | (-0.25, -0.04) |
| <i>b6</i> | Intercept             | -1.83           | (-2.12, -1.55)  | <i>g7</i>  | <i>b3</i> → <i>g7</i>  | 0.52            | (0.32, 0.72)   |
| <i>b6</i> | <i>b4</i> → <i>b6</i> | -22.5           | (-68.55, -2.85) | <i>g7</i>  | <i>g9</i> → <i>g7</i>  | 0.17            | (0.08, 0.26)   |
| <i>g1</i> | Intercept             | 0.00            | (-0.09, 0.09)   | <i>g7</i>  | precision              | 1.09            | (0.95, 1.24)   |
| <i>g1</i> | precision             | 1.00            | (0.87, 1.14)    | <i>g8</i>  | Intercept              | 0.00            | (-0.09, 0.09)  |
| <i>g2</i> | Intercept             | 0.00            | (-0.08, 0.08)   | <i>g8</i>  | <i>g11</i> → <i>g8</i> | -0.26           | (-0.35, -0.17) |
| <i>g2</i> | <i>g6</i> → <i>g2</i> | 0.28            | (0.19, 0.37)    | <i>g8</i>  | precision              | 1.07            | (0.93, 1.22)   |
| <i>g2</i> | <i>g8</i> → <i>g2</i> | -0.23           | (-0.32, -0.14)  | <i>g9</i>  | Intercept              | 0.00            | (-0.08, 0.08)  |
| <i>g2</i> | precision             | 1.13            | (0.98, 1.28)    | <i>g9</i>  | <i>g2</i> → <i>g9</i>  | 0.17            | (0.08, 0.27)   |
| <i>g3</i> | Intercept             | -0.08           | (-0.15, 0.00)   | <i>g9</i>  | <i>g6</i> → <i>g9</i>  | 0.20            | (0.11, 0.29)   |
| <i>g3</i> | <i>b3</i> → <i>g3</i> | 0.28            | (0.14, 0.42)    | <i>g9</i>  | precision              | 1.09            | (0.95, 1.25)   |
| <i>g3</i> | <i>g2</i> → <i>g3</i> | 0.72            | (0.65, 0.78)    | <i>g10</i> | Intercept              | 0.00            | (-0.08, 0.08 ) |
| <i>g3</i> | precision             | 2.22            | (1.94, 2.53)    | <i>g10</i> | <i>g5</i> → <i>g10</i> | -0.34           | (-0.42, -0.25) |
| <i>g4</i> | Intercept             | -0.10           | (-0.19, 0.00)   | <i>g10</i> | precision              | 1.13            | (0.98, 1.28)   |
| <i>g4</i> | <i>b3</i> → <i>g4</i> | 0.36            | (0.18, 0.54)    | <i>g11</i> | Intercept              | 0.00            | (-0.09, 0.09)  |
| <i>g4</i> | <i>g2</i> → <i>g4</i> | -0.50           | (-0.58, -0.42)  | <i>g11</i> | precision              | 1.00            | (0.87, 1.14)   |
| <i>g4</i> | precision             | 1.35            | (1.18, 1.54)    | <i>g12</i> | Intercept              | 0.00            | (-0.09, 0.09)  |
| <i>g5</i> | Intercept             | -0.17           | (-0.28, -0.06)  | <i>g12</i> | precision              | 1.00            | (0.87, 1.14)   |