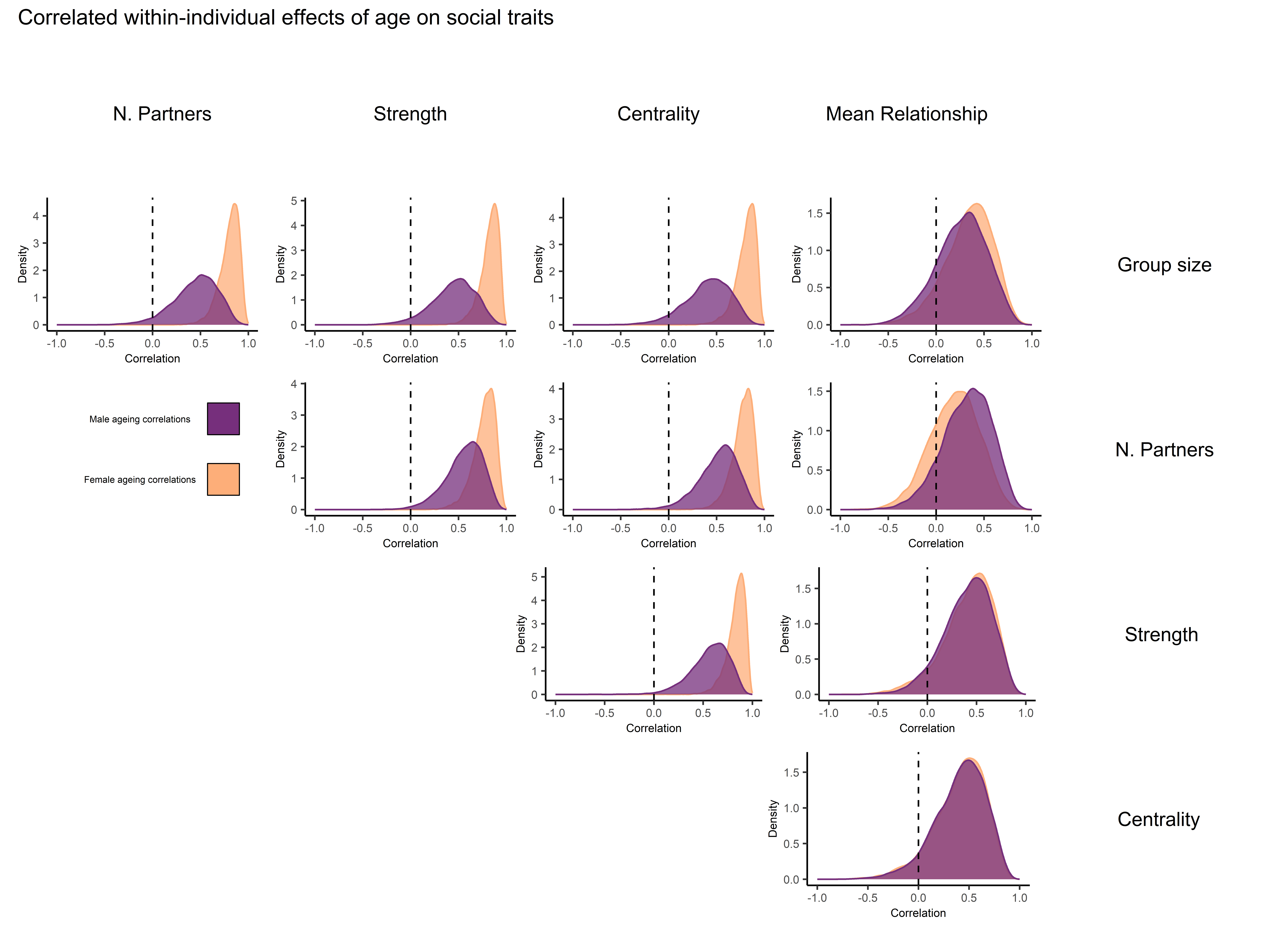
Electronic supplement

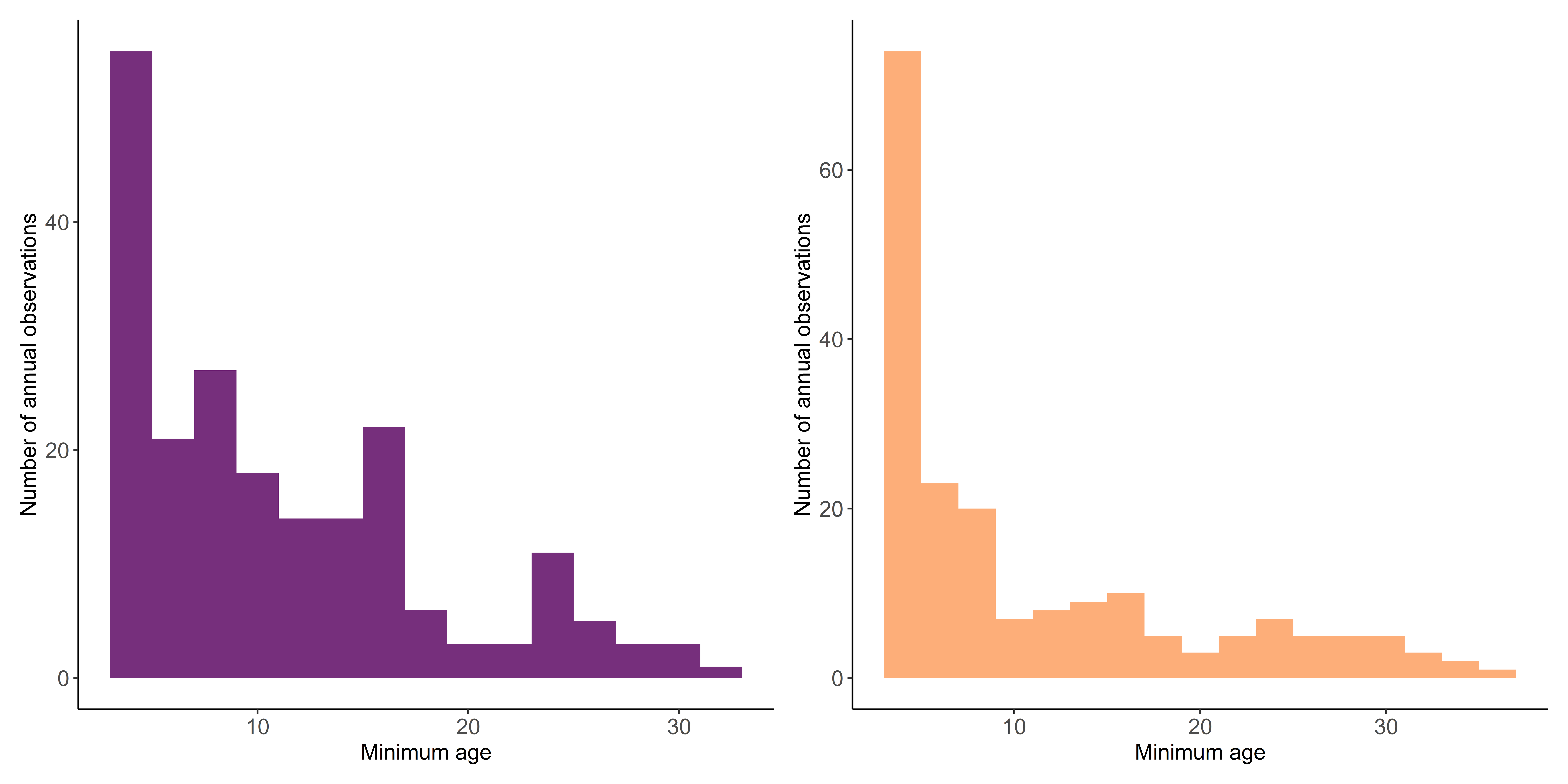
Sam F. Walmsley, Laura Feyrer, Claire Girard, Elizabeth Zwamborn, Hal Whitehead

This document contains supplemental figures and tables accompanying the article “Social ageing varies within a population of bottlenose whales”.

# Supplementary figures

|  |
| --- |
| Figure S1 – Correlations between within-individual effects of age on social traits in northern bottlenose whales. Positive correlations imply linked changes in individual patterns of social ageing across traits. Note that this does not include related between-individual effects. |





# Numerical summaries of social ageing models

## Male group size

**Table S1** – Results of model explaining group size in male northern bottlenose whales as a function of minimum age.

| Term | Estimate | *SE* | PI-Lower | PI-Upper |
| --- | --- | --- | --- | --- |
| Intercept | 1.45 | 0.13 | 1.23 | 1.66 |
| meanMinAge | -0.01 | 0.01 | -0.02 | 0.00 |
| deltaMinAge | 0.00 | 0.01 | -0.02 | 0.02 |
| sd(Intercept) | 0.25 | 0.04 | 0.20 | 0.32 |
| sd(deltaMinAge) | 0.05 | 0.01 | 0.03 | 0.06 |
| cor(Intercept,deltaMinAge) | 0.04 | 0.28 | -0.42 | 0.49 |
| sd(Intercept) | 0.35 | 0.09 | 0.24 | 0.51 |

## Female group size

**Table S2** – Results of model explaining group size in female northern bottlenose whales as a function of minimum age.

| Term | Estimate | *SE* | PI-Lower | PI-Upper |
| --- | --- | --- | --- | --- |
| Intercept | 1.25 | 0.11 | 1.06 | 1.44 |
| meanMinAge | 0.01 | 0.00 | -0.00 | 0.01 |
| deltaMinAge | 0.01 | 0.02 | -0.02 | 0.04 |
| sd(Intercept) | 0.13 | 0.04 | 0.08 | 0.20 |
| sd(deltaMinAge) | 0.10 | 0.02 | 0.07 | 0.13 |
| cor(Intercept,deltaMinAge) | -0.43 | 0.24 | -0.78 | -0.01 |
| sd(Intercept) | 0.38 | 0.09 | 0.26 | 0.54 |

## Male number of social partners

**Table S3** – Results of model explaining number of social partners in male northern bottlenose whales as a function of minimum age.

| Term | Estimate | *SE* | PI-Lower | PI-Upper |
| --- | --- | --- | --- | --- |
| Intercept | 1.37 | 0.18 | 1.06 | 1.66 |
| numSamplingPeriodsByYear | 0.16 | 0.01 | 0.14 | 0.18 |
| meanMinAge | -0.01 | 0.01 | -0.03 | 0.00 |
| deltaMinAge | -0.00 | 0.02 | -0.03 | 0.02 |
| sd(Intercept) | 0.27 | 0.04 | 0.20 | 0.34 |
| sd(deltaMinAge) | 0.05 | 0.02 | 0.03 | 0.07 |
| cor(Intercept,deltaMinAge) | -0.19 | 0.30 | -0.65 | 0.33 |
| sd(Intercept) | 0.51 | 0.13 | 0.34 | 0.77 |

## Female number of social partners

**Table S4** – Results of model explaining number of social partners in female northern bottlenose whales as a function of minimum age.

| Term | Estimate | *SE* | PI-Lower | PI-Upper |
| --- | --- | --- | --- | --- |
| Intercept | 1.14 | 0.19 | 0.83 | 1.44 |
| numSamplingPeriodsByYear | 0.15 | 0.01 | 0.14 | 0.17 |
| meanMinAge | 0.01 | 0.01 | -0.00 | 0.02 |
| deltaMinAge | 0.01 | 0.02 | -0.03 | 0.05 |
| sd(Intercept) | 0.24 | 0.05 | 0.17 | 0.32 |
| sd(deltaMinAge) | 0.11 | 0.02 | 0.07 | 0.14 |
| cor(Intercept,deltaMinAge) | -0.58 | 0.23 | -0.90 | -0.17 |
| sd(Intercept) | 0.57 | 0.15 | 0.37 | 0.84 |

## Male network strength

**Table S5** – Results of model explaining social network strength in male northern bottlenose whales as a function of minimum age.

| Term | Estimate | *SE* | PI-Lower | PI-Upper |
| --- | --- | --- | --- | --- |
| Intercept | 0.05 | 0.14 | -0.18 | 0.27 |
| numSamplingPeriodsByYear | 0.05 | 0.01 | 0.03 | 0.06 |
| meanMinAge | -0.01 | 0.01 | -0.02 | -0.00 |
| deltaMinAge | 0.01 | 0.01 | -0.01 | 0.03 |
| sd(Intercept) | 0.09 | 0.05 | 0.01 | 0.17 |
| sd(deltaMinAge) | 0.01 | 0.01 | 0.00 | 0.03 |
| cor(Intercept,deltaMinAge) | 0.01 | 0.56 | -0.89 | 0.90 |
| sd(Intercept) | 0.43 | 0.12 | 0.28 | 0.65 |

## Female network strength

**Table S6** – Results of model explaining social network strength in female northern bottlenose whales as a function of minimum age.

| Term | Estimate | *SE* | PI-Lower | PI-Upper |
| --- | --- | --- | --- | --- |
| Intercept | -0.16 | 0.17 | -0.44 | 0.10 |
| numSamplingPeriodsByYear | 0.04 | 0.01 | 0.03 | 0.06 |
| meanMinAge | 0.00 | 0.00 | -0.00 | 0.01 |
| deltaMinAge | 0.01 | 0.01 | -0.00 | 0.03 |
| sd(Intercept) | 0.03 | 0.02 | 0.00 | 0.08 |
| sd(deltaMinAge) | 0.03 | 0.01 | 0.01 | 0.06 |
| cor(Intercept,deltaMinAge) | -0.11 | 0.56 | -0.92 | 0.84 |
| sd(Intercept) | 0.56 | 0.14 | 0.36 | 0.83 |

## Male network centrality

**Table S7** – Results of model explaining social network centrality in male northern bottlenose whales as a function of minimum age.

| Term | Estimate | *SE* | PI-Lower | PI-Upper |
| --- | --- | --- | --- | --- |
| Intercept | -0.67 | 0.20 | -1.00 | -0.33 |
| numSamplingPeriodsByYear | 0.08 | 0.03 | 0.04 | 0.12 |
| meanMinAge | -0.02 | 0.01 | -0.04 | -0.00 |
| deltaMinAge | 0.00 | 0.02 | -0.03 | 0.04 |
| sd(Intercept) | 0.25 | 0.13 | 0.04 | 0.46 |
| sd(deltaMinAge) | 0.03 | 0.02 | 0.00 | 0.06 |
| cor(Intercept,deltaMinAge) | 0.13 | 0.56 | -0.84 | 0.93 |
| sd(Intercept) | 0.38 | 0.11 | 0.23 | 0.57 |

## Female network centrality

**Table S8** – Results of model explaining social network centrality in female northern bottlenose whales as a function of minimum age.

| Term | Estimate | *SE* | PI-Lower | PI-Upper |
| --- | --- | --- | --- | --- |
| Intercept | -1.02 | 0.20 | -1.34 | -0.70 |
| numSamplingPeriodsByYear | 0.10 | 0.02 | 0.07 | 0.14 |
| meanMinAge | 0.01 | 0.01 | -0.01 | 0.02 |
| deltaMinAge | 0.02 | 0.03 | -0.02 | 0.07 |
| sd(Intercept) | 0.08 | 0.06 | 0.01 | 0.19 |
| sd(deltaMinAge) | 0.10 | 0.04 | 0.03 | 0.16 |
| cor(Intercept,deltaMinAge) | 0.05 | 0.54 | -0.86 | 0.89 |
| sd(Intercept) | 0.39 | 0.12 | 0.22 | 0.61 |

## Male mean relationship strength

**Table S9** – Results of model explaining mean bond strength in male northern bottlenose whales as a function of minimum age.

| Term | Estimate | *SE* | PI-Lower | PI-Upper |
| --- | --- | --- | --- | --- |
| Intercept | -2.30 | 0.10 | -2.45 | -2.13 |
| meanMinAge | -0.00 | 0.01 | -0.01 | 0.01 |
| deltaMinAge | 0.00 | 0.01 | -0.02 | 0.02 |
| sd(Intercept) | 0.07 | 0.05 | 0.01 | 0.16 |
| sd(deltaMinAge) | 0.01 | 0.01 | 0.00 | 0.03 |
| cor(Intercept,deltaMinAge) | 0.03 | 0.57 | -0.89 | 0.90 |
| sd(Intercept) | 0.20 | 0.07 | 0.10 | 0.33 |

## Female mean relationship strength

**Table S10** – Results of model explaining mean bond strength in female northern bottlenose whales as a function of minimum age.

| Term | Estimate | *SE* | PI-Lower | PI-Upper |
| --- | --- | --- | --- | --- |
| Intercept | -2.45 | 0.08 | -2.58 | -2.31 |
| meanMinAge | 0.01 | 0.00 | -0.00 | 0.01 |
| deltaMinAge | 0.01 | 0.01 | -0.01 | 0.03 |
| sd(Intercept) | 0.05 | 0.04 | 0.00 | 0.12 |
| sd(deltaMinAge) | 0.02 | 0.01 | 0.00 | 0.05 |
| cor(Intercept,deltaMinAge) | 0.10 | 0.57 | -0.88 | 0.91 |
| sd(Intercept) | 0.14 | 0.07 | 0.05 | 0.26 |

# Robustness check: Individuals with genetically confirmed sex

## Male group size (genetic sex only)

**Table S11** – Results of model explaining group size in male northern bottlenose whales as a function of minimum age.

| Term | Estimate | *SE* | PI-Lower | PI-Upper |
| --- | --- | --- | --- | --- |
| Intercept | 1.50 | 0.26 | 1.07 | 1.92 |
| meanMinAge | -0.02 | 0.01 | -0.04 | 0.01 |
| deltaMinAge | -0.02 | 0.03 | -0.07 | 0.03 |
| sd(Intercept) | 0.36 | 0.11 | 0.22 | 0.55 |
| sd(deltaMinAge) | 0.06 | 0.03 | 0.03 | 0.11 |
| cor(Intercept,deltaMinAge) | 0.50 | 0.33 | -0.13 | 0.93 |
| sd(Intercept) | 0.48 | 0.12 | 0.32 | 0.71 |

## Female group size (genetic sex only)

**Table S12** – Results of model explaining group size in female northern bottlenose whales as a function of minimum age.

| Term | Estimate | *SE* | PI-Lower | PI-Upper |
| --- | --- | --- | --- | --- |
| Intercept | 1.27 | 0.17 | 0.97 | 1.54 |
| meanMinAge | 0.01 | 0.01 | -0.00 | 0.02 |
| deltaMinAge | 0.01 | 0.04 | -0.06 | 0.08 |
| sd(Intercept) | 0.13 | 0.09 | 0.01 | 0.30 |
| sd(deltaMinAge) | 0.10 | 0.04 | 0.05 | 0.18 |
| cor(Intercept,deltaMinAge) | -0.34 | 0.50 | -0.95 | 0.67 |
| sd(Intercept) | 0.42 | 0.13 | 0.25 | 0.65 |

## Male number of social partners (genetic sex only)

**Table S13** – Results of model explaining number of social partners in male northern bottlenose whales as a function of minimum age.

| Term | Estimate | *SE* | PI-Lower | PI-Upper |
| --- | --- | --- | --- | --- |
| Intercept | 1.42 | 0.33 | 0.87 | 1.95 |
| numSamplingPeriodsByYear | 0.15 | 0.02 | 0.11 | 0.19 |
| meanMinAge | -0.01 | 0.02 | -0.04 | 0.01 |
| deltaMinAge | -0.03 | 0.03 | -0.08 | 0.02 |
| sd(Intercept) | 0.38 | 0.13 | 0.20 | 0.62 |
| sd(deltaMinAge) | 0.05 | 0.03 | 0.01 | 0.10 |
| cor(Intercept,deltaMinAge) | 0.19 | 0.48 | -0.65 | 0.90 |
| sd(Intercept) | 0.62 | 0.17 | 0.40 | 0.93 |

## Female number of social partners (genetic sex only)

**Table S14** – Results of model explaining number of social partners in female northern bottlenose whales as a function of minimum age.

| Term | Estimate | *SE* | PI-Lower | PI-Upper |
| --- | --- | --- | --- | --- |
| Intercept | 0.83 | 0.27 | 0.37 | 1.27 |
| numSamplingPeriodsByYear | 0.28 | 0.03 | 0.22 | 0.33 |
| meanMinAge | 0.01 | 0.01 | -0.01 | 0.02 |
| deltaMinAge | 0.01 | 0.05 | -0.07 | 0.08 |
| sd(Intercept) | 0.14 | 0.11 | 0.01 | 0.34 |
| sd(deltaMinAge) | 0.11 | 0.05 | 0.04 | 0.20 |
| cor(Intercept,deltaMinAge) | 0.05 | 0.56 | -0.87 | 0.91 |
| sd(Intercept) | 0.44 | 0.15 | 0.23 | 0.72 |

## Male network strength (genetic sex only)

**Table S15** – Results of model explaining number of social partners in male northern bottlenose whales as a function of minimum age.

| Term | Estimate | *SE* | PI-Lower | PI-Upper |
| --- | --- | --- | --- | --- |
| Intercept | 0.25 | 0.22 | -0.11 | 0.60 |
| numSamplingPeriodsByYear | 0.02 | 0.02 | -0.01 | 0.06 |
| meanMinAge | -0.02 | 0.01 | -0.03 | 0.00 |
| deltaMinAge | 0.00 | 0.02 | -0.03 | 0.04 |
| sd(Intercept) | 0.16 | 0.09 | 0.02 | 0.32 |
| sd(deltaMinAge) | 0.03 | 0.02 | 0.00 | 0.07 |
| cor(Intercept,deltaMinAge) | 0.18 | 0.56 | -0.84 | 0.93 |
| sd(Intercept) | 0.41 | 0.12 | 0.24 | 0.63 |

## Female network strength (genetic sex only)

**Table S16** – Results of model explaining social network strength in female northern bottlenose whales as a function of minimum age.

| Term | Estimate | *SE* | PI-Lower | PI-Upper |
| --- | --- | --- | --- | --- |
| Intercept | -0.22 | 0.20 | -0.56 | 0.09 |
| numSamplingPeriodsByYear | 0.11 | 0.03 | 0.06 | 0.15 |
| meanMinAge | 0.01 | 0.01 | 0.00 | 0.02 |
| deltaMinAge | 0.01 | 0.02 | -0.02 | 0.04 |
| sd(Intercept) | 0.12 | 0.09 | 0.01 | 0.28 |
| sd(deltaMinAge) | 0.02 | 0.02 | 0.00 | 0.06 |
| cor(Intercept,deltaMinAge) | -0.11 | 0.58 | -0.93 | 0.86 |
| sd(Intercept) | 0.23 | 0.11 | 0.06 | 0.42 |

## Male network centrality (genetic sex only)

**Table S17** – Results of model explaining social network centrality in male northern bottlenose whales as a function of minimum age.

| Term | Estimate | *SE* | PI-Lower | PI-Upper |
| --- | --- | --- | --- | --- |
| Intercept | -0.27 | 0.47 | -1.02 | 0.48 |
| numSamplingPeriodsByYear | 0.02 | 0.06 | -0.08 | 0.11 |
| meanMinAge | -0.03 | 0.03 | -0.07 | 0.01 |
| deltaMinAge | -0.01 | 0.05 | -0.08 | 0.07 |
| sd(Intercept) | 0.52 | 0.26 | 0.12 | 0.96 |
| sd(deltaMinAge) | 0.07 | 0.05 | 0.01 | 0.18 |
| cor(Intercept,deltaMinAge) | 0.18 | 0.55 | -0.84 | 0.93 |
| sd(Intercept) | 0.31 | 0.20 | 0.03 | 0.66 |

## Female network centrality (genetic sex only)

**Table S18** – Results of model explaining social network centrality in female northern bottlenose whales as a function of minimum age.

| Term | Estimate | *SE* | PI-Lower | PI-Upper |
| --- | --- | --- | --- | --- |
| Intercept | -1.71 | 0.46 | -2.48 | -0.97 |
| numSamplingPeriodsByYear | 0.21 | 0.07 | 0.10 | 0.33 |
| meanMinAge | 0.03 | 0.01 | 0.00 | 0.05 |
| deltaMinAge | 0.01 | 0.06 | -0.09 | 0.09 |
| sd(Intercept) | 0.18 | 0.15 | 0.01 | 0.46 |
| sd(deltaMinAge) | 0.09 | 0.07 | 0.01 | 0.24 |
| cor(Intercept,deltaMinAge) | -0.16 | 0.57 | -0.94 | 0.83 |
| sd(Intercept) | 0.43 | 0.25 | 0.07 | 0.86 |

## Female mean relationship strength

**Table S19** – Results of model explaining mean bond strength in male northern bottlenose whales as a function of minimum age.

| Term | Estimate | *SE* | PI-Lower | PI-Upper |
| --- | --- | --- | --- | --- |
| Intercept | -2.35 | 0.20 | -2.68 | -2.04 |
| meanMinAge | -0.00 | 0.01 | -0.02 | 0.02 |
| deltaMinAge | -0.00 | 0.03 | -0.04 | 0.04 |
| sd(Intercept) | 0.12 | 0.09 | 0.01 | 0.29 |
| sd(deltaMinAge) | 0.03 | 0.03 | 0.00 | 0.08 |
| cor(Intercept,deltaMinAge) | 0.06 | 0.57 | -0.89 | 0.91 |
| sd(Intercept) | 0.16 | 0.11 | 0.01 | 0.36 |

## Male mean relationship strength

**Table S20** – Results of model explaining mean bond strength in female northern bottlenose whales as a function of minimum age.

| Term | Estimate | *SE* | PI-Lower | PI-Upper |
| --- | --- | --- | --- | --- |
| Intercept | -2.40 | 0.17 | -2.68 | -2.11 |
| meanMinAge | 0.00 | 0.01 | -0.01 | 0.02 |
| deltaMinAge | -0.01 | 0.03 | -0.06 | 0.03 |
| sd(Intercept) | 0.13 | 0.10 | 0.01 | 0.32 |
| sd(deltaMinAge) | 0.03 | 0.02 | 0.00 | 0.07 |
| cor(Intercept,deltaMinAge) | -0.06 | 0.57 | -0.91 | 0.89 |
| sd(Intercept) | 0.14 | 0.11 | 0.01 | 0.35 |

# Robustness check: Females observed over a span of at least 10 years

## Female group size (obs. spanning 10+ years only)

**Table S21** – Results of model explaining group size in female northern bottlenose whales as a function of minimum age, excluding females detected over a span of less than 10 years.

| Term | Estimate | *SE* | PI-Lower | PI-Upper |
| --- | --- | --- | --- | --- |
| Intercept | 1.21 | 0.18 | 0.91 | 1.49 |
| meanMinAge | 0.00 | 0.01 | -0.01 | 0.02 |
| deltaMinAge | -0.00 | 0.02 | -0.04 | 0.03 |
| sd(Intercept) | 0.10 | 0.06 | 0.01 | 0.22 |
| sd(deltaMinAge) | 0.06 | 0.02 | 0.04 | 0.09 |
| cor(Intercept,deltaMinAge) | 0.06 | 0.51 | -0.79 | 0.87 |
| sd(Intercept) | 0.44 | 0.12 | 0.29 | 0.66 |

## Female number of social partners (obs. spanning 10+ years only)

**Table S22** – Results of model explaining number of social partners in female northern bottlenose whales as a function of minimum age, excluding females detected over a span of less than 10 years.

| Term | Estimate | *SE* | PI-Lower | PI-Upper |
| --- | --- | --- | --- | --- |
| Intercept | 1.06 | 0.29 | 0.59 | 1.51 |
| numSamplingPeriodsByYear | 0.17 | 0.02 | 0.13 | 0.21 |
| meanMinAge | 0.01 | 0.01 | -0.01 | 0.02 |
| deltaMinAge | -0.01 | 0.02 | -0.05 | 0.03 |
| sd(Intercept) | 0.12 | 0.08 | 0.01 | 0.27 |
| sd(deltaMinAge) | 0.06 | 0.02 | 0.03 | 0.10 |
| cor(Intercept,deltaMinAge) | -0.33 | 0.49 | -0.95 | 0.64 |
| sd(Intercept) | 0.66 | 0.19 | 0.41 | 1.01 |

## Female network strength (obs. spanning 10+ years only)

**Table S23** – Results of model explaining social network strength in female northern bottlenose whales as a function of minimum age, excluding females detected over a span of less than 10 years.

| Term | Estimate | *SE* | PI-Lower | PI-Upper |
| --- | --- | --- | --- | --- |
| Intercept | -0.14 | 0.22 | -0.50 | 0.22 |
| numSamplingPeriodsByYear | 0.06 | 0.02 | 0.03 | 0.09 |
| meanMinAge | 0.00 | 0.01 | -0.01 | 0.01 |
| deltaMinAge | -0.00 | 0.01 | -0.02 | 0.02 |
| sd(Intercept) | 0.05 | 0.04 | 0.00 | 0.14 |
| sd(deltaMinAge) | 0.02 | 0.01 | 0.00 | 0.04 |
| cor(Intercept,deltaMinAge) | 0.12 | 0.57 | -0.86 | 0.93 |
| sd(Intercept) | 0.57 | 0.18 | 0.34 | 0.89 |

## Female network centrality (obs. spanning 10+ years only)

**Table S24** – Results of model explaining social network centrality in female northern bottlenose whales as a function of minimum age, excluding females detected over a span of less than 10 years.

| Term | Estimate | *SE* | PI-Lower | PI-Upper |
| --- | --- | --- | --- | --- |
| Intercept | -0.94 | 0.35 | -1.53 | -0.38 |
| numSamplingPeriodsByYear | 0.09 | 0.05 | 0.01 | 0.18 |
| meanMinAge | 0.00 | 0.01 | -0.02 | 0.03 |
| deltaMinAge | 0.01 | 0.03 | -0.04 | 0.05 |
| sd(Intercept) | 0.12 | 0.10 | 0.01 | 0.31 |
| sd(deltaMinAge) | 0.05 | 0.03 | 0.01 | 0.12 |
| cor(Intercept,deltaMinAge) | 0.17 | 0.55 | -0.81 | 0.94 |
| sd(Intercept) | 0.22 | 0.15 | 0.02 | 0.49 |

## Female mean relationship strength (obs. spanning 10+ years only)

**Table S25** – Results of model explaining mean bond strength in female northern bottlenose whales as a function of minimum age, excluding females detected over a span of less than 10 years.

| Term | Estimate | *SE* | PI-Lower | PI-Upper |
| --- | --- | --- | --- | --- |
| Intercept | -2.45 | 0.17 | -2.73 | -2.17 |
| meanMinAge | 0.00 | 0.01 | -0.01 | 0.02 |
| deltaMinAge | 0.01 | 0.02 | -0.02 | 0.03 |
| sd(Intercept) | 0.08 | 0.06 | 0.01 | 0.20 |
| sd(deltaMinAge) | 0.02 | 0.02 | 0.00 | 0.05 |
| cor(Intercept,deltaMinAge) | 0.06 | 0.58 | -0.89 | 0.92 |
| sd(Intercept) | 0.09 | 0.07 | 0.01 | 0.22 |

# Models testing for selective disappearance

## Male group size

**Table S26** – Results of model testing for selective disappearance of male northern bottlenose whales based on group size.

| Term | Estimate | *SE* | PI-Lower | PI-Upper |
| --- | --- | --- | --- | --- |
| Intercept | 1.48 | 0.13 | 1.27 | 1.70 |
| meanMinAge | -0.01 | 0.01 | -0.03 | 0.02 |
| minimumAge | -0.00 | 0.01 | -0.02 | 0.01 |
| sd(Intercept) | 0.26 | 0.04 | 0.21 | 0.32 |
| sd(Intercept) | 0.33 | 0.08 | 0.22 | 0.48 |

## Female group size

**Table S27** – Results of model testing for selective disappearance of female northern bottlenose whales based on group size.

| Term | Estimate | *SE* | PI-Lower | PI-Upper |
| --- | --- | --- | --- | --- |
| Intercept | 1.26 | 0.11 | 1.08 | 1.45 |
| meanMinAge | -0.01 | 0.01 | -0.03 | 0.01 |
| minimumAge | 0.02 | 0.01 | 0.00 | 0.03 |
| sd(Intercept) | 0.21 | 0.03 | 0.16 | 0.27 |
| sd(Intercept) | 0.36 | 0.09 | 0.25 | 0.53 |

## Male number of social partners

**Table S28** – Results of model testing for selective disappearance of male northern bottlenose whales based on number of social partners.

| Term | Estimate | *SE* | PI-Lower | PI-Upper |
| --- | --- | --- | --- | --- |
| Intercept | 1.40 | 0.18 | 1.10 | 1.68 |
| numSamplingPeriodsByYear | 0.15 | 0.01 | 0.13 | 0.17 |
| meanMinAge | 0.00 | 0.02 | -0.03 | 0.03 |
| minimumAge | -0.01 | 0.01 | -0.03 | 0.01 |
| sd(Intercept) | 0.26 | 0.04 | 0.19 | 0.33 |
| sd(Intercept) | 0.51 | 0.13 | 0.34 | 0.76 |

## Female number of social partners

**Table S29** – Results of model testing for selective disappearance of female northern bottlenose whales based on number of social partners.

| Term | Estimate | *SE* | PI-Lower | PI-Upper |
| --- | --- | --- | --- | --- |
| Intercept | 1.25 | 0.18 | 0.94 | 1.55 |
| numSamplingPeriodsByYear | 0.14 | 0.01 | 0.12 | 0.16 |
| meanMinAge | -0.01 | 0.01 | -0.03 | 0.01 |
| minimumAge | 0.01 | 0.01 | -0.01 | 0.03 |
| sd(Intercept) | 0.27 | 0.05 | 0.19 | 0.36 |
| sd(Intercept) | 0.55 | 0.14 | 0.37 | 0.82 |

## Male network strength

**Table S30** – Results of model testing for selective disappearance of male northern bottlenose whales based on social network strength.

| Term | Estimate | *SE* | PI-Lower | PI-Upper |
| --- | --- | --- | --- | --- |
| Intercept | 0.06 | 0.14 | -0.17 | 0.28 |
| numSamplingPeriodsByYear | 0.05 | 0.01 | 0.03 | 0.06 |
| meanMinAge | -0.02 | 0.01 | -0.04 | 0.00 |
| minimumAge | 0.01 | 0.01 | -0.01 | 0.03 |
| sd(Intercept) | 0.09 | 0.04 | 0.01 | 0.16 |
| sd(Intercept) | 0.42 | 0.11 | 0.27 | 0.63 |

## Female network strength

**Table S31** – Results of model testing for selective disappearance of female northern bottlenose whales based on social network strength

| Term | Estimate | *SE* | PI-Lower | PI-Upper |
| --- | --- | --- | --- | --- |
| Intercept | -0.14 | 0.17 | -0.44 | 0.11 |
| numSamplingPeriodsByYear | 0.04 | 0.01 | 0.03 | 0.06 |
| meanMinAge | -0.01 | 0.01 | -0.02 | 0.01 |
| minimumAge | 0.01 | 0.01 | -0.00 | 0.03 |
| sd(Intercept) | 0.03 | 0.03 | 0.00 | 0.08 |
| sd(Intercept) | 0.56 | 0.15 | 0.36 | 0.83 |

## Male network centrality

**Table S32** – Results of model testing for selective disappearance of male northern bottlenose whales based on social network centrality.

| Term | Estimate | *SE* | PI-Lower | PI-Upper |
| --- | --- | --- | --- | --- |
| Intercept | -0.64 | 0.21 | -0.99 | -0.30 |
| numSamplingPeriodsByYear | 0.08 | 0.02 | 0.04 | 0.12 |
| meanMinAge | -0.02 | 0.03 | -0.07 | 0.02 |
| minimumAge | 0.00 | 0.02 | -0.03 | 0.03 |
| sd(Intercept) | 0.26 | 0.13 | 0.04 | 0.46 |
| sd(Intercept) | 0.38 | 0.11 | 0.23 | 0.58 |

## Female network centrality

**Table S33** – Results of model testing for selective disappearance of female northern bottlenose whales based on social network centrality.

| Term | Estimate | *SE* | PI-Lower | PI-Upper |
| --- | --- | --- | --- | --- |
| Intercept | -0.97 | 0.19 | -1.30 | -0.65 |
| numSamplingPeriodsByYear | 0.09 | 0.02 | 0.06 | 0.13 |
| meanMinAge | -0.01 | 0.02 | -0.05 | 0.02 |
| minimumAge | 0.02 | 0.02 | -0.01 | 0.05 |
| sd(Intercept) | 0.08 | 0.06 | 0.01 | 0.20 |
| sd(Intercept) | 0.38 | 0.13 | 0.21 | 0.61 |

## Male mean relationship strength

**Table S34** – Results of model testing for selective disappearance of male northern bottlenose whales based on mean relationship strength.

| Term | Estimate | *SE* | PI-Lower | PI-Upper |
| --- | --- | --- | --- | --- |
| Intercept | -2.29 | 0.10 | -2.45 | -2.12 |
| meanMinAge | -0.00 | 0.01 | -0.03 | 0.02 |
| minimumAge | 0.00 | 0.01 | -0.02 | 0.02 |
| sd(Intercept) | 0.07 | 0.05 | 0.01 | 0.16 |
| sd(Intercept) | 0.20 | 0.08 | 0.10 | 0.34 |

## Female mean relationship strength

**Table S35** – Results of model testing for selective disappearance of female northern bottlenose whales based on mean relationship strength.

| Term | Estimate | *SE* | PI-Lower | PI-Upper |
| --- | --- | --- | --- | --- |
| Intercept | -2.45 | 0.08 | -2.58 | -2.32 |
| meanMinAge | -0.00 | 0.01 | -0.03 | 0.02 |
| minimumAge | 0.01 | 0.01 | -0.01 | 0.03 |
| sd(Intercept) | 0.05 | 0.04 | 0.00 | 0.12 |
| sd(Intercept) | 0.13 | 0.06 | 0.04 | 0.25 |