

## Supplementary Material

# Noise affects multimodal communication during courtship in a marine fish

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## 1 Supplementary Tables

**Supplementary Table 1A.** Effect of male size on log(total visual courtship) in the control treatment.

|             | Estimate | Std. Error | t value | CI (2.5%) | CI (95%) |
|-------------|----------|------------|---------|-----------|----------|
| (Intercept) | 1.02     | 1.90       | 0.54    | -3.05     | 5.10     |
| Male size   | 0.04     | 0.05       | 0.82    | -0.06     | 0.13     |

Residual standard error: 0.59, Multiple R-squared: 0.05, Adjusted R-squared: -0.02

F-statistic: 0.67 on 1 and 14 DF, p-value: 0.43

**Supplementary Table 1B.** Effect of male size on log(total visual courtship) in the added noise treatment.

|                  | Estimate    | Std. Error  | t value     | CI (2.5%)   | CI (95%)    |
|------------------|-------------|-------------|-------------|-------------|-------------|
| (Intercept)      | -2.65       | 2.18        | -1.22       | -7.22       | 1.92        |
| <b>Male size</b> | <b>0.12</b> | <b>0.05</b> | <b>2.26</b> | <b>0.01</b> | <b>0.23</b> |

Residual standard error: 0.62 on 18, Multiple R-squared: 0.22, Adjusted R-squared: 0.18

F-statistic: 5.10 on 1 and 18 DF, p-value: 0.04

**Supplementary Table 2A.** Effect of male condition on log(total visual courtship) in the control treatment.

|             | Estimate | Std. Error | t value | CI (2.5%) | CI (95%) |
|-------------|----------|------------|---------|-----------|----------|
| (Intercept) | 3.46     | 2.09       | 1.66    | -1.02     | 7.95     |
| K           | -1.01    | 2.35       | -0.43   | -6.05     | 4.04     |

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Residual standard error: 0.60, Multiple R-squared: 0.01, Adjusted R-squared: -0.06

F-statistic: 0.18 on 1 and 14 df, p-value: 0.68

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**Supplementary Table 2B.** Effect of male condition on log(total visual courtship) in the added noise treatment.

|             | Estimate | Std. Error | t value | CI (2.5%) | CI (95%) |
|-------------|----------|------------|---------|-----------|----------|
| (Intercept) | 0.79     | 2.41       | 0.33    | -4.28     | 5.86     |
| K           | 1.74     | 2.86       | 0.61    | -4.25     | 7.74     |

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Residual standard error: 0.70, Multiple R-squared: 0.02, Adjusted R-squared: -0.03

F-statistic: 0.37 on 1 and 18 df, p-value: 0.55

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**Supplementary Table 3A.** Effect of male size on total acoustic courtship in the control treatment.

|             | Estimate | Std. Error | t value | CI (2.5%) | CI (95%) |
|-------------|----------|------------|---------|-----------|----------|
| (Intercept) | 6.60     | 3.44       | 1.92    | -0.28     | 13.23    |
| Male size   | -0.06    | 0.08       | -0.72   | -0.22     | 0.10     |

Null deviance: 1279.9 on 15 degrees of freedom

Residual deviance: 1242.1 on 14 degrees of freedom

**Supplementary Table 3B.** Effect of male size on total acoustic courtship in the added noise treatment\*

|             | Estimate             | Std. Error           | t value              | CI (2.5%)             | CI (95%)             |
|-------------|----------------------|----------------------|----------------------|-----------------------|----------------------|
| (Intercept) | -4.69 (-11.05)       | 5.00 (6.15)          | -0.94 (-1.80)        | -14.75 (-24.05)       | 5.29 (0.58)          |
| Male size   | 0.19 ( <b>0.35</b> ) | 0.12 ( <b>0.14</b> ) | 1.67 ( <b>2.43</b> ) | -0.04 ( <b>0.07</b> ) | 0.42 ( <b>0.64</b> ) |

Null deviance: 1575.4 on 19 degrees of freedom (1509.2 on 18 degrees of freedom)

Residual deviance: 1365.5 on 18 degrees of freedom (1066.5 on 17 degrees of freedom)

\* In this model we found one outlier based on Cook's distance > 1, numbers in brackets represent the model after removal of this outlier.

**Supplementary Table 4A.** Effect of male condition on total acoustic courtship in the control treatment.

|             | Estimate | Std. Error | t value | CI (2.5%) | CI (95%) |
|-------------|----------|------------|---------|-----------|----------|
| (Intercept) | -2.16    | 3.36       | -0.64   | -8.89     | 4.51     |
| K           | 6.98     | 3.65       | 1.91    | -0.40     | 14.13    |

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Null deviance: 1279.9 on 15 degrees of freedom

Residual deviance: 1038.1 on 14 degrees of freedom

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**Supplementary Table 4B.** Effect of male condition on total acoustic courtship in the added noise treatment.

|             | Estimate | Std. Error | t value | CI (2.5%) | CI (95%) |
|-------------|----------|------------|---------|-----------|----------|
| (Intercept) | 2.34     | 6.22       | 0.38    | -11.48    | 13.23    |
| K           | 1.34     | 7.33       | 0.18    | -11.82    | 17.29    |

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Null deviance: 1575.4 on 19 degrees of freedom

Residual deviance: 1572.0 on 18 degrees of freedom

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**Supplementary Table 5A.** Effect of total visual courtship on spawning success in the control treatment.

|                        | Estimate | Std. Error | t value | CI (2.5%) | CI (95%) |
|------------------------|----------|------------|---------|-----------|----------|
| (Intercept)            | -0.34    | 1.29       | -0.26   | -3.08     | 2.25     |
| Total visual courtship | 0.08     | 0.09       | 0.92    | -0.08     | 0.28     |

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Null deviance: 19.9 on 15 degrees of freedom

Residual deviance: 18.9 on 14 degrees of freedom

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**Supplementary Table 5B.** Effect of total visual courtship on spawning success in the added noise treatment.

|                               | Estimate    | Std. Error  | t value     | CI (2.5%)    | CI (95%)    |
|-------------------------------|-------------|-------------|-------------|--------------|-------------|
| (Intercept)                   | -2.11       | 1.24        | -1.70       | -5.04        | -0.02       |
| <b>Total visual courtship</b> | <b>0.17</b> | <b>0.10</b> | <b>1.63</b> | <b>0.006</b> | <b>0.41</b> |

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Null deviance: 27.5 on 19 degrees of freedom

Residual deviance: 22.9 on 18 degrees of freedom

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**Supplementary Table 6A.** Effect of total acoustic courtship on spawning success in the control treatment.

|                                 | Estimate    | Std. Error  | t value     | CI (2.5%)   | CI (95%)    |
|---------------------------------|-------------|-------------|-------------|-------------|-------------|
| (Intercept)                     | -0.62       | 0.60        | -1.03       | -1.89       | 0.54        |
| <b>Total acoustic courtship</b> | <b>0.05</b> | <b>0.03</b> | <b>1.63</b> | <b>0.02</b> | <b>0.19</b> |

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Null deviance: 19.9 on 15 degrees of freedom

Residual deviance: 11.4 on 14 degrees of freedom

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**Supplementary Table 6B.** Effect of total acoustic courtship on spawning success in the added noise treatment.

|                                 | Estimate    | Std. Error  | t value     | CI (2.5%)   | CI (95%)    |
|---------------------------------|-------------|-------------|-------------|-------------|-------------|
| (Intercept)                     | -1.76       | 0.69        | -2.55       | -3.39       | -0.56       |
| <b>Total acoustic courtship</b> | <b>0.48</b> | <b>0.37</b> | <b>1.29</b> | <b>0.06</b> | <b>1.84</b> |

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Null deviance: 27.5 on 19 degrees of freedom

Residual deviance: 11.7 on 18 degrees of freedom

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**Supplementary Table 7A.** Effect of male size on spawning success in the control treatment.

|             | Estimate | Std. Error | t value | CI (2.5%) | CI (95%) |
|-------------|----------|------------|---------|-----------|----------|
| (Intercept) | 15.10    | 10.53      | 1.43    | -2.15     | 42.20    |
| Male size   | -0.34    | 0.25       | -1.37   | -0.97     | 0.07     |

Null deviance: 19.9 on 15 degrees of freedom

Residual deviance: 16.8 on 14 degrees of freedom

**Supplementary Table 7B.** Effect of male size on spawning success in the added noise treatment.

|             | Estimate | Std. Error | t value | CI (2.5%) | CI (95%) |
|-------------|----------|------------|---------|-----------|----------|
| (Intercept) | -5.89    | 7.66       | -0.77   | -22.62    | 8.82     |
| Male size   | 0.14     | 0.18       | 0.75    | -0.22     | 0.54     |

Null deviance: 27.5 on 19 degrees of freedom

Residual deviance: 26.9 on 18 degrees of freedom

**Supplementary Table 8A.** Effect of male condition on spawning success in the control treatment.

|             | Estimate | Std. Error | t value | CI (2.5%) | CI (95%) |
|-------------|----------|------------|---------|-----------|----------|
| (Intercept) | -3.86    | 8.60       | -0.45   | -24.18    | 11.99    |
| K           | 5.27     | 9.78       | 0.54    | -12.50    | 28.81    |

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Null deviance: 19.9 on 15 degrees of freedom

Residual deviance: 19.5 on 14 degrees of freedom

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**Supplementary Table 8B.** Effect of male condition on spawning success in the added noise treatment.

|             | Estimate | Std. Error | t value | CI (2.5%) | CI (95%) |
|-------------|----------|------------|---------|-----------|----------|
| (Intercept) | -10.32   | 8.73       | -1.18   | -30.89    | 5.03     |
| K           | 11.96    | 10.26      | 1.17    | -6.17     | 36.02    |

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Null deviance: 27.5 on 19 degrees of freedom

Residual deviance: 25.8 on 18 degrees of freedom

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