

**Supplementary material**

## **Appendix 1**

### **Sexual pigmentation and parental risk-taking in yellow warblers (*Setophaga petechia*)**

We explored relationships between levels of carotenoid- and melanin-based pigmentation and parental risk-taking for offspring in yellow warblers (*Setophaga petechia*) of both sexes, and also asked whether birds took higher levels of parental risk when paired to a colorful mate. We experimentally increased perceived adult-directed predation risk near nests, and measured sexual pigmentation using digital photograph and spectrometry. This Online Supplement contains full linear mixed models (LMMs) that were too extensive to include in the main text.

**Table A1.** LMM predicting paternal provisioning rate from male pigmentation variables and predation risk treatment.

	Estimate ( $\beta \pm$ SE)	F	df (Denom.)	P(> F)
Intercept <sup>a</sup>	1.24 $\pm$ 0.62	--	--	0.04
Treatment <sup>b</sup>	-1.20 $\pm$ 0.19	75.51	111.99	< 0.001
Carotenoid PC1	0.12 $\pm$ 0.11	1.11	67.10	0.29
Melanin coverage	0.01 $\pm$ 0.11	0.03	61.13	0.84
Nest concealment	-0.01 $\pm$ 0.11	2.27	82.90	0.13
Treatment order <sup>c</sup>	-0.46 $\pm$ 0.21	4.93	159.47	0.02
Time	0.09 $\pm$ 0.03	5.33	161.56	0.02
Brood size	0.03 $\pm$ 0.06	0.23	78.89	0.62
Nestling age	0.12 $\pm$ 0.07	2.53	131.56	0.11
Treatment $\times$ carotenoid PC1	-0.02 $\pm$ 0.12	0.03	110.37	0.85
Treatment $\times$ concealment	0.33 $\pm$ 0.12	7.21	110.23	0.008
Carotenoid PC1 $\times$ concealment	-0.13 $\pm$ 0.10	0.16	142.13	0.68
Treatment $\times$ melanin coverage	-0.06 $\pm$ 0.13	0.23	110.39	0.62
Melanin coverage $\times$ concealment	-0.07 $\pm$ 0.11	0.07	80.48	0.78
Treatment $\times$ treatment order	0.18 $\pm$ 0.33	0.32	133.26	0.57
Treatment $\times$ carotenoid $\times$ concealment	0.33 $\pm$ 0.13	6.10	110.03	0.01
Treatment $\times$ melanin $\times$ concealment	0.08 $\pm$ 0.12	0.45	109.47	0.49

N = 179 observations, 66 nests, 65 females, 56 males.

<sup>a</sup>P value from initial LMM output, not an F test.

<sup>b</sup>Predation risk treatment contrasted to baseline.

<sup>c</sup>Predation risk treatment first, contrasted to baseline treatment first.

**Table A2.** LMM predicting maternal provisioning rate from female pigmentation variables and predation risk treatment.

	Estimate ( $\beta \pm SE$ )	F	df (Denom.)	P(> F)
Intercept <sup>a</sup>	2.06 $\pm$ 0.76	--	--	0.008
Treatment <sup>c</sup>	-0.52 $\pm$ 0.23	41.72	66.85	< 0.001
Carotenoid PC1	0.05 $\pm$ 0.15	0.20	38.67	0.65
Melanin score	-0.04 $\pm$ 0.14	1.72	43.58	0.19
Nest concealment	-0.08 $\pm$ 0.13	1.89	33.58	0.17
Treatment order <sup>2</sup>	0.34 $\pm$ 0.24	0.28	99.34	0.59
Time	-0.06 $\pm$ 0.04	2.05	98.95	0.15
Brood size	0.25 $\pm$ 0.10	6.11	36.96	0.01
Nestling age	0.13 $\pm$ 0.08	2.33	98.55	0.13
Treatment $\times$ carotenoid PC1	-0.24 $\pm$ 0.15	2.47	65.16	0.12
Treatment $\times$ melanin score	0.46 $\pm$ 0.15	8.46	67.05	0.004
Treatment $\times$ nest concealment	0.53 $\pm$ 0.14	14.17	65.02	< 0.001
Carotenoid PC1 $\times$ concealment	0.09 $\pm$ 0.16	0.12	35.25	0.72
Melanin score $\times$ concealment	0.09 $\pm$ 0.13	0.005	37.39	0.94
Treatment $\times$ treatment order	-0.91 $\pm$ 0.39	5.24	82.60	0.02
Treatment $\times$ carotenoid $\times$ concealment	-0.07 $\pm$ 0.15	0.27	64.10	0.59
Treatment $\times$ melanin $\times$ concealment	-0.16 $\pm$ 0.14	1.22	66.77	0.27

N = 117 observations, 44 nests, 42 females, 40 males.

<sup>a</sup>P value from initial LMM output, not an F test.

<sup>b</sup>Predation risk treatment contrasted to baseline.

<sup>c</sup>Predation risk treatment first, contrasted to baseline treatment first.

**Table A3.** Full LMM predicting paternal provisioning from female pigmentation and predation risk treatment.

	Estimate ( $\beta \pm$ SE)	F	df (Denom.)	P(> F)
Intercept <sup>a</sup>	1.73 $\pm$ 0.87	--	--	< 0.001
Treatment <sup>b</sup>	-0.92 $\pm$ 0.26	40.83	64.99	< 0.001
Carotenoid PC1	-0.09 $\pm$ 0.17	0.46	36.25	0.50
Nest concealment	-0.01 $\pm$ 0.14	3.17	11.79	0.10
Melanin score	-0.01 $\pm$ 0.16	0.47	40.50	0.49
Treatment order <sup>c</sup>	-0.13 $\pm$ 0.27	1.70	99.28	0.19
Time	0.008 $\pm$ 0.05	0.02	80.88	0.87
Brood size	0.02 $\pm$ 0.11	0.05	33.95	0.80
Nestling age	0.14 $\pm$ 0.10	2.04	98.51	0.15
Treatment $\times$ carotenoid PC1	-0.03 $\pm$ 0.17	0.04	63.37	0.83
Treatment $\times$ nest concealment	0.51 $\pm$ 0.16	10.41	63.17	0.001
Carotenoid PC1 $\times$ concealment	0.27 $\pm$ 0.19	0.69	32.75	0.41
Treatment $\times$ melanin score	0.25 $\pm$ 0.18	2.00	65.30	0.16
Melanin score $\times$ concealment	-0.14 $\pm$ 0.15	1.72	35.59	0.19
Treatment $\times$ treatment order	-0.35 $\pm$ 0.44	0.62	80.01	0.43
Treatment $\times$ carotenoid $\times$ concealment	-0.24 $\pm$ 0.17	2.09	62.26	0.15
Treatment $\times$ melanin $\times$ concealment	-0.11 $\pm$ 0.16	0.50	64.93	0.48

N = 117 observations, 44 nests, 42 females, 40 males.

<sup>a</sup>P value from initial LMM output, not an F test.

<sup>b</sup>Predation risk treatment contrasted to baseline.

<sup>c</sup>Predation risk treatment first, contrasted to baseline treatment first.

**Table A4.** LMM predicting maternal provisioning rate from male pigmentation and predation risk treatment.

	Estimate ( $\beta \pm$ SE)	F	df (Denom.)	P (> F)
Intercept <sup>a</sup>	1.82 $\pm$ 0.61	--	--	0.003
Treatment <sup>b</sup>	-0.74 $\pm$ 0.20	52.10	106.77	< 0.001
Carotenoid PC1	0.11 $\pm$ 0.11	3.32	48.256	0.07
Nest concealment	-0.01 $\pm$ 0.11	1.59	55.884	0.21
Melanin coverage	0.15 $\pm$ 0.11	1.66	54.145	0.20
Treatment order	0.09 $\pm$ 0.21	0.37	150.858	0.53
Time	0.006 $\pm$ 0.04	0.02	159.415	0.87
Brood size	0.06 $\pm$ 0.06	0.98	46.601	0.32
Nestling age	0.11 $\pm$ 0.07	2.46	107.683	0.11
Treatment $\times$ carotenoid PC1	0.14 $\pm$ 0.12	1.23	105.115	0.26
Treatment $\times$ nest concealment	0.28 $\pm$ 0.12	4.93	104.58	0.02
Carotenoid PC1 $\times$ concealment	-0.03 $\pm$ 0.11	0.07	34.002	0.78
Treatment $\times$ melanin coverage	-0.03 $\pm$ 0.13	0.08	104.852	0.77
Melanin coverage $\times$ concealment	0.05 $\pm$ 0.11	0.008	57.114	0.92
Treatment $\times$ treatment order	-0.39 $\pm$ 0.34	1.34	133.399	0.24
Treatment $\times$ carotenoid $\times$ concealment	0.13 $\pm$ 0.14	0.90	104.447	0.34
Treatment $\times$ melanin $\times$ concealment	-0.08 $\pm$ 0.13	0.45	103.899	0.50

N = 179 observations, 66 nests, 65 females, 56 males.

<sup>a</sup>P value from initial LMM output, not an F test.

<sup>b</sup>Predation risk treatment contrasted to baseline.

<sup>c</sup>Predation risk treatment first, contrasted to baseline treatment first.

**Table A5.** LMM predicting parental provisioning rate from sex and predation risk treatment.

	Estimate ( $\beta \pm$ SE)	F	df (Denom.)	P (>F)
Intercept <sup>a</sup>	1.27 $\pm$ 0.46	--	--	0.006
Treatment <sup>b</sup>	-0.95 $\pm$ 0.18	112.33	315.51	< 0.001
Sex <sup>c</sup>	0.03 $\pm$ 0.11	0.37	295.81	0.54
Nest concealment	0.008 $\pm$ 0.09	4.62	61.72	0.03
Treatment order <sup>d</sup>	-0.26 $\pm$ 0.17	4.47	190.44	0.03
Brood size	0.07 $\pm$ 0.04	2.35	59.26	0.12
Nestling age	0.15 $\pm$ 0.05	7.89	136.85	0.005
Time	0.05 $\pm$ 0.03	3.36	224.98	0.06
Treatment $\times$ sex	-0.19 $\pm$ 0.19	1.03	295.81	0.30
Treatment $\times$ nest concealment	0.29 $\pm$ 0.13	10.10	307.56	0.001
Sex $\times$ nest concealment	-0.01 $\pm$ 0.11	< 0.001	295.98	0.97
Treatment $\times$ treatment order	0.01 $\pm$ 0.26	0.004	361.2	0.94
Treatment $\times$ sex $\times$ concealment	0.03 $\pm$ 0.19	0.02	295.98	0.87

N = 378 observations, 72 nests, 67 females, 57 males.

<sup>a</sup>P value from initial LMM output, not an F test.

<sup>b</sup>Predation risk treatment contrasted to baseline.

<sup>c</sup>Males contrasted to females.

<sup>d</sup>Predation risk treatment first, contrasted to baseline treatment first.