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Association between DRD4 gene polymorphism and personality variation in great tits

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1 **Electronic Supporting Information**

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3 **Association between DRD4 gene polymorphism and personality variation in great tits: a**
4 **test across four wild populations**

5 *Korsten et al.*

6

7 **TABLES**

8

9 **Table S1.** Wild great tit populations investigated for association of exploratory behaviour and
10 *DRD4* SNP830 and ID15 genotype ($n = 666$ individuals).

Population	Coordinates	Exploration test period	Sample size		
			Male	Female	Total
Westerheide (WH), The Netherlands	52°00'N, 05°50'E	July–Sept 2007	45	34	79
Lauwersmeer (LM), The Netherlands	53°20'N, 06°12'E	Oct 2005–March 2006 Aug 2006–March 2007	21 64	38 73	59 137
Boshoek (BH), Belgium	51°08'N, 04°32'E	July–Aug 2007	53	50	103
Wytham Woods (WW), United Kingdom	51°47'N, 1°20'W	Feb–March 2005 Sept 2005–March 2006 Feb 2008–March 2008	31 50 45	37 61 64	68 111 109

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12 **Table S2.** None of the four great tit populations deviated significantly from Hardy-Weinberg
13 equilibrium for the *DRD4* SNP830 and ID15 polymorphisms.

	SNP830			ID15		
	χ^2	<i>n</i>	<i>P</i>	χ^2	<i>n</i>	<i>P</i>
Westerheide (WH)	1.492	77	0.47	0.838	79	0.66
Lauwersmeer (LM)	0.082	191	0.96	0.055	196	0.97
Boshoek (BH)	1.236	99	0.54	0.562	103	0.76
Wytham Woods (WW)	1.29	288	0.52	0.58	113	0.75

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15 **Table S3.** No main effects of the sex of individuals or genotype \times sex interaction effects on
 16 exploration scores in four populations of wild great tits. Significance of the sex and the
 17 SNP830 genotype \times sex terms was assessed by adding them sequentially to the model.

18 A) Additive genetic model

	SNP830		Sex		SNP830 \times Sex	
	Δ deviance	<i>P</i>	Δ deviance	<i>P</i>	Δ deviance	<i>P</i>
	(χ^2_1)		(χ^2_1)		(χ^2_1)	
Westerheide (<i>n</i> = 77)	4.316	0.038	0.374	0.54	0.004	0.95
Lauwersmeer (<i>n</i> = 191)	1.473	0.22	1.274	0.26	1.050	0.31
Boshoek (<i>n</i> = 99)	0.036	0.85	0.401	0.53	0.021	0.89
Wytham Woods, (<i>n</i> = 288)	0.352	0.55	1.891	0.17	0.198	0.66

19 B) Dominant-T genetic model

	SNP830		Sex		SNP830 \times Sex	
	Δ deviance	<i>P</i>	Δ deviance	<i>P</i>	Δ deviance	<i>P</i>
	(χ^2_1)		(χ^2_1)		(χ^2_1)	
Westerheide (<i>n</i> = 77)	3.480	0.062	0.321	0.57	0.040	0.84
Lauwersmeer (<i>n</i> = 191)	3.749	0.053	1.289	0.26	0.395	0.53
Boshoek (<i>n</i> = 99)	0.001	0.97	0.385	0.54	0.072	0.79
Wytham Woods, (<i>n</i> = 288)	0.632	0.43	1.908	0.17	0.968	0.33

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22 **Table S4.** Associations between exploratory behaviour and *DRD4* ID15 genotype in four wild
 23 great tit populations.

24 (A) Additive genetic model

Population	Δ deviance (χ^2_1)	<i>P</i>	Total variance explained
Westerheide (<i>n</i> = 79)	0.216	0.64	0.3%
Lauwersmeer (<i>n</i> = 196)	0.178	0.67	0.09%
Boshoek (<i>n</i> = 103)	0.067	0.80	0.1%
Wytham Woods (<i>n</i> = 113)	0.926	0.34	0.8%

25 (B) Dominant ID15- genetic model

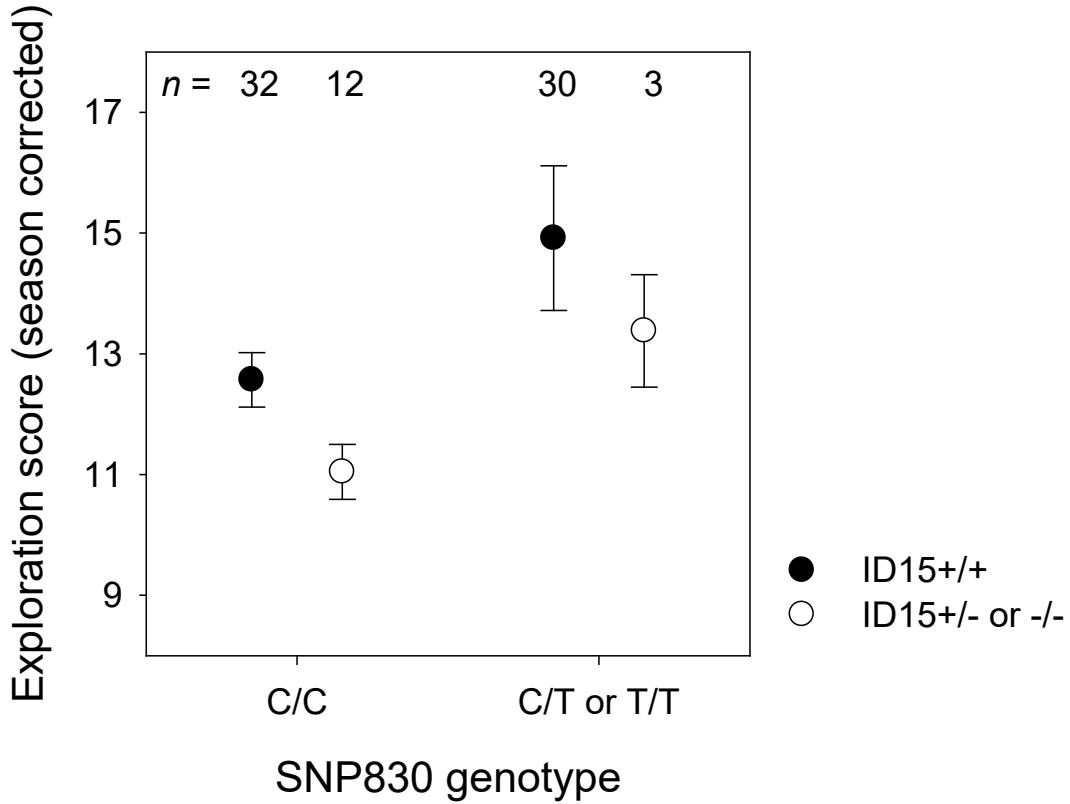
Population	Δ deviance (χ^2_1)	<i>P</i>	Total variance explained
Westerheide (<i>n</i> = 79)	0.333	0.56	0.4%
Lauwersmeer (<i>n</i> = 196)	0.043	0.84	0.02%
Boshoek (<i>n</i> = 103)	0.286	0.59	0.3%
Wytham Woods (<i>n</i> = 113)	1.009	0.32	0.9%

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28 FIGURES

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32 **Figure S1.** Exploration scores (corrected for seasonal trend; means with standard errors) of
33 wild great tits of the Westerheide population in relation to the *DRD4* SNP830 and ID15
34 genotypes. Groups represent individuals either with or without the SNP830 T allele and either
35 with or without the ID15- allele (following Fidler *et al.* 2007). The interaction between the
36 SNP830 and the ID15 polymorphisms was not significant (Δ deviance < 0.001, $df = 1$, $P =$
37 0.99).

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39 **REFERENCES**

- 40 Fidler AE, van Oers K, Drent PJ, Kuhn S, Mueller JC, Kempenaers B (2007) DRD4 gene
41 polymorphisms are associated with personality variation in a passerine bird.
42 *Proceedings of the Royal Society of London. Series B, Biological Sciences*, **274**, 1685-
43 1691.