



Correction to: Do Testosterone and Cortisol Jointly Relate to Adolescent Dominance? A Pre-registered Multi-method Interrogation of the Dual-Hormone Hypothesis

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The original published version of this article contained mistakes. There were errors in **Table 2**, **Supplementary Tables 5 and 6**, and the **Results**.

In **Table 2**, values in the “SE_β” and “CI_β” columns were incorrect. Values in the “β” column for all T x C and T x C x Gender interaction terms were also incorrect. The correct values are below in a corrected version of **Table 2**.

All confidence intervals and beta values for T x C interactions were incorrect in **Supplementary Table 5**. Beta values for T x C and T x C x Gender interactions were incorrect in **Supplementary Table 6**. The corrected supplementary tables can be found at <https://osf.io/kzne2/>.

Paragraphs five through twelve of the “**Results**” section, “**Dual-Hormone Hypothesis**,” reflect these errors. The Results section should read as follows:

Observer-Rated Dominance

For salivary hormones, there was a small main effect of T on observer-rated dominance, such that adolescents with lower levels of T were rated as more dominant, on average ($\beta = -0.13$, 95% CI [-0.24, -0.02], $p = 0.02$). Main effects of C ($\beta = 0.07$,

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Table 2 Hierarchical Regression Results Predicting Dominance

Step	Variable	B	β	SE $_{\beta}$	CI $_{\beta}$	<i>p</i>	R ²	F(<i>p</i>)
OV: Observer-rater Dominance								
Model 1: Salivary Hormones								
1	Saliva time	<0.01	0.02	0.05	[-0.07, 0.12]	0.64	0.27	54.73 (<0.001)
	Leader–Follower Time	-0.59	-0.52	0.05	[-0.61, -0.42]	<0.001		
2	Gender	<0.01	<0.01	0.05	[-0.11, 0.11]	0.998	0.30	21.13 (<0.001)
	T	-0.12	-0.13	0.06	[-0.24, -0.02]	0.02		
	C	0.10	0.07	0.06	[-0.05, 0.18]	0.24		
3	T x C	-0.05	-0.03	0.06	[-0.14, 0.08]	0.55	0.30	17.62 (<0.001)
4	T x C x Gender	0.31	0.10	0.06	[-0.01, 0.22]	0.07	0.32	12.53 (<0.001)
Model 2: Hair Hormones								
1	Leader–Follower Time	-0.58	-0.51	0.05	[-0.61, -0.42]	<0.001	0.26	110.80 (<0.001)
2	Gender	0.04	0.02	0.06	[-0.10, 0.14]	0.74	0.29	20.00 (<0.001)
	T	0.06	0.07	0.06	[-0.05, 0.19]	0.27		
	C	-0.02	-0.03	0.06	[-0.15, 0.10]	0.65		
3	T x C	-0.06	-0.09	0.06	[-0.21, 0.03]	0.14	0.29	16.53 (<0.001)
4	T x C x Gender	-0.12	-0.08	0.06	[-0.20, +0.04]	0.20	0.31	10.82 (<0.001)
OV: AMS Dominance-Parent								
Model 3: Salivary Hormones								
1	Saliva time	<0.01	-0.02	0.06	[-0.14, 0.10]	0.72	0.03	1.73 (0.14)
	Digits Forward	-0.01	-0.05	0.07	[-0.20, 0.09]	0.45		
	Digits Backward	<0.01	0.01	0.07	[-0.14, 0.15]	0.93		
	Trails B Time	-0.002	-0.16	0.07	[-0.29, -0.03]	0.01		
2	Gender	0.04	0.06	0.07	[-0.08, 0.20]	0.38	0.03	1.00 (0.43)
	T	-0.01	-0.05	0.07	[-0.19, 0.10]	0.54		
	C	0.01	0.02	0.07	[-0.13, 0.17]	0.79		
3	T x C	<0.01	0.01	0.07	[-0.13, 0.15]	0.89	0.03	0.88 (0.54)
4	T x C x Gender	0.01	0.01	0.07	[-0.14, 0.15]	0.90	0.04	0.72 (0.72)
Model 4: Hair Hormones								
1	Digits Forward	-0.01	-0.04	0.07	[-0.18, 0.10]	0.56	0.02	2.10 (0.10)
	Digits Backward	<0.01	<0.01	0.07	[-0.14, 0.15]	0.95		
	Trails B Time	-0.001	-0.16	0.06	[-0.28, -0.03]	0.02		
2	Gender	0.05	0.07	0.08	[-0.08, 0.22]	0.37	0.03	0.85 (0.53)
	T	0.01	0.03	0.08	[-0.12, 0.19]	0.66		
	C	0.03	0.11	0.08	[-0.04, 0.27]	0.15		
3	T x C	<0.01	<0.01	0.07	[-0.15, 0.15]	0.998	0.03	0.73 (0.65)
4	T x C x Gender	-0.05	-0.09	0.07	[-0.24, 0.06]	0.23	0.05	0.88 (0.55)
OV: AMS Dominance-Youth								
Model 5: Salivary Hormones								
1	Saliva Time	<0.01	0.13	0.06	[0.02, 0.25]	0.02	0.07	5.62 (<0.001)
	Digits Forward	<0.01	0.03	0.07	[-0.10, 0.17]	0.61		
	Digits Backward	<0.01	<0.01	0.07	[-0.13, 0.14]	0.95		
	Trails B Time	-0.002	-0.23	0.06	[-0.35, -0.11]	<0.001		

Table 2 (continued)

Step	Variable	B	β	SE $_{\beta}$	CI $_{\beta}$	p	R ²	F(p)
2	Gender	-0.003	-0.01	0.06	[-0.13, 0.12]	0.93	0.08	3.08 (0.004)
	T	<0.01	0.01	0.07	[-0.12, 0.14]	0.88		
	C	-0.02	-0.05	0.07	[-0.18, 0.08]	0.45		
3	T x C	0.04	0.09	0.07	[-0.05, 0.22]	0.20	0.09	2.91 (0.004)
4	T x C x Gender	0.01	0.01	0.07	[-0.13, 0.14]	0.93	0.11	2.66 (0.003)
Model 6: Hair Hormones								
1	Digits Forward	0.01	0.05	0.07	[-0.09, 0.18]	0.48	0.05	5.49 (0.001)
	Digits Backward	-0.0002	-0.001	0.07	[-0.14, 0.13]	0.99		
	Trails B Time	-0.002	-0.21	0.06	[-0.33, -0.10]	<0.001		
2	Gender	0.05	0.09	0.07	[-0.05, 0.23]	0.22	0.06	2.14 (0.05)
	T	0.02	0.08	0.07	[-0.07, 0.22]	0.29		
	C	-0.02	-0.11	0.07	[-0.25, 0.04]	0.16		
3	T x C	0.02	0.11	0.07	[-0.04, 0.25]	0.15	0.07	2.15 (0.04)
4	T x C x Gender	-0.05	-0.10	0.07	[-0.24, 0.04]	0.17	0.10	2.18 (0.02)
OV: MPQ Social Potency-Youth								
Model 7: Salivary Hormones								
1	Saliva Time	<0.01	0.11	0.07	[-0.02, 0.24]	0.09	0.04	2.33 (0.06)
	Digits Forward	-0.01	-0.04	0.08	[-0.20, 0.11]	0.57		
	Digits Backward	<0.01	<0.01	0.08	[-0.16, 0.16]	0.97		
	Trails B Time	-0.003	-0.18	0.07	[-0.31, -0.04]	0.01		
2	Gender	-0.02	-0.02	0.07	[-0.17, 0.12]	0.73	0.10	2.60 (0.01)
	T	0.07	0.17	0.08	[0.01, 0.33]	0.04		
	C	-0.16	-0.21	0.08	[-0.37, -0.05]	0.01		
3	T x C	0.10	0.13	0.08	[-0.02, 0.28]	0.10	0.11	2.65 (0.01)
4	T x C x Gender	-0.04	-0.03	0.08	[-0.19, 0.13]	0.75	0.15	2.80 (0.002)
Model 8: Hair Hormones								
1	Digits Forward	-0.01	-0.03	0.08	[-0.18, 0.12]	0.70	0.03	2.10 (0.10)
	Digits Backward	<0.01	<0.01	0.08	[-0.15, 0.16]	0.97		
	Trails B Time	-0.001	-0.17	0.07	[-0.30, -0.03]	0.02		
2	Gender	0.09	0.10	0.08	[-0.06, 0.25]	0.24	0.04	1.06 (0.39)
	T	0.04	0.10	0.08	[-0.07, 0.27]	0.23		
	C	0.01	0.02	0.09	[-0.15, 0.19]	0.82		
3	T x C	0.05	0.15	0.09	[-0.03, 0.33]	0.10	0.06	1.30 (0.26)
4	T x C x Gender	-0.003	-0.003	0.09	[-0.17, 0.17]	0.97	0.10	1.72 (0.08)

Note. In Step 3, models included all main effects and in Step 4, models included all main effects and lower-order two-way interactions. Full model results can be found on the OSF page for this project (<https://osf.io/9n8gf/>). SE, Standard Error; CI, Confidence Interval; OV, Outcome Variable; T, Testosterone; C, Cortisol; AMS, Achievement Motivation Scale; MPQ, Multidimensional Personality Questionnaire

95% CI [-0.05, 0.18], $p=0.24$) and gender ($\beta<0.01$, 95% CI [-0.11, 0.11], $p>0.99$) on observer-rated dominance were nonsignificant. The T×C interaction was nonsignificant ($\beta=-0.03$, 95% CI [-0.14, 0.08], $p=0.55$, $\Delta R^2<0.01$; **Figure 1a**). The

T×C×gender interaction was also nonsignificant ($\beta=0.10$, 95% CI [-0.01, 0.22], $p=0.07$, $\Delta R^2=0.02$). However, in models run separately by participant gender, the direction of the T×C interaction was negative in males ($\beta=-0.12$, 95% CI [-0.30, +0.06], $p=0.17$) and positive in females ($\beta=0.08$, 95% CI [-0.06, 0.22], $p=0.27$).

For hair hormones, main effects of T ($\beta=0.07$, 95% CI [-0.05, 0.19], $p=0.27$), C ($\beta=-0.03$, 95% CI [-0.15, 0.10], $p=0.65$), and gender ($\beta=0.02$, 95% CI [-0.10, 0.14], $p=0.74$) on observer-rated dominance were nonsignificant. The T×C interaction was nonsignificant ($\beta=-0.09$, 95% CI [-0.21, 0.03], $p=0.14$, $\Delta R^2 < 0.01$; **Figure 2a**). The T×C×gender interaction was also nonsignificant ($\beta=-0.08$, 95% CI [-0.20, +0.04], $p=0.20$, $\Delta R^2=0.01$), though the T×C interaction was positive in males ($\beta=0.04$, 95% CI [-0.17, 0.25], $p=0.69$) and negative in females ($\beta=-0.13$, 95% CI [-0.29, 0.03], $p=0.10$).

Parent-Reported AMS Dominance

For salivary hormones, main effects of T ($\beta=-0.05$, 95% CI [-0.19, 0.10], $p=0.54$), C ($\beta=0.02$, 95% CI [-0.13, 0.17], $p=0.79$), and gender ($\beta=0.06$, 95% CI [-0.08, 0.20], $p=0.38$) on parent-reported dominance were nonsignificant. The T×C interaction was nonsignificant ($\beta=0.01$, 95% CI [-0.13, 0.15], $p=0.89$, $\Delta R^2 < 0.01$; **Figure 1b**) and the direction of this effect was equivalent in males and females. The T×C×gender interaction was also nonsignificant ($\beta=0.01$, 95% CI [-0.14, 0.15], $p=0.90$, $\Delta R^2 < 0.01$).

For hair hormones, main effects of T ($\beta=0.03$, 95% CI [-0.12, 0.19], $p=0.66$), C ($\beta=0.11$, 95% CI [-0.04, 0.27], $p=0.15$), and gender ($\beta=0.07$, 95% CI [-0.08, 0.22], $p=0.37$) on parent-reported dominance were also nonsignificant. The T×C interaction was nonsignificant ($\beta < 0.01$, 95% CI [-0.15, 0.15], $p > 0.99$, $\Delta R^2 < 0.01$; **Figure 2b**). The T×C×gender interaction was also nonsignificant ($\beta=-0.09$, 95% CI [-0.24, 0.06], $p=0.23$, $\Delta R^2=0.02$), though the T×C interaction was positive in males ($\beta=0.13$, 95% CI [-0.15, 0.40], $p=0.36$) and negative in females ($\beta=-0.04$, 95% CI [-0.24, 0.16], $p=0.69$).

Youth-Reported AMS Dominance

For salivary hormones, main effects of T ($\beta=0.01$, 95% CI [-0.12, 0.14], $p=0.88$), C ($\beta=-0.05$, 95% CI [-0.18, 0.08], $p=0.45$), and gender ($\beta=-0.01$, 95% CI [-0.13, 0.12], $p=0.93$) on youth-reported dominance were nonsignificant. The T×C interaction was nonsignificant ($\beta=0.09$, 95% CI [-0.05, 0.22], $p=0.20$, $\Delta R^2=0.01$; **Figure 1c**) and the direction of this effect was equivalent in males and females. The T×C×gender interaction was also nonsignificant ($\beta=0.01$, 95% CI [-0.13, 0.14], $p=0.93$, $\Delta R^2=0.02$).

For hair hormones, main effects of T ($\beta=0.08$, 95% CI [-0.07, 0.22], $p=0.29$), C ($\beta=-0.11$, 95% CI [-0.25, 0.04], $p=0.16$), and gender ($\beta=0.09$, 95% CI [-0.05, 0.23], $p=0.22$) on youth-reported dominance were also nonsignificant. The T×C interaction was nonsignificant ($\beta=0.11$, 95% CI [-0.04, 0.25], $p=0.15$, $\Delta R^2=0.01$; **Figure 2c**) and the direction of this effect was equivalent in males and females. The T×C×gender interaction was also nonsignificant ($\beta=-0.10$, 95% CI [-0.24, 0.04], $p=0.17$, $\Delta R^2=0.03$).

Youth-Reported MPQ Social Potency

For salivary hormones, there was a small main effect of T on youth-reported social potency, such that adolescents with higher levels of salivary T were higher in social potency, on average ($\beta=0.17$, 95% CI [0.01, 0.33], $p=0.04$). There was also a small main effect of C, such that adolescents with lower levels of salivary C were higher in social potency, on average ($\beta=-0.21$, 95% CI [-0.37, -0.05], $p=0.01$). The main effect of gender on social potency was nonsignificant ($\beta=-0.02$, 95% CI [-0.17, 0.12], $p=0.73$). The T×C interaction was nonsignificant ($\beta=0.13$, 95% CI [-0.02, 0.28], $p=0.10$, $\Delta R^2=0.01$; **Figure 1d**) and the direction of this effect was equivalent in males and females. The T×C×gender interaction was also nonsignificant ($\beta=-0.03$, 95% CI [-0.19, 0.13], $p=0.75$, $\Delta R^2=0.04$).

For hair hormones, main effects of T ($\beta=0.10$, 95% CI [-0.07, 0.27], $p=0.23$), C ($\beta=0.02$, 95% CI [-0.15, 0.19], $p=0.82$) and gender ($\beta=0.10$, 95% CI [-0.06, 0.25], $p=0.24$) on youth-reported social potency were nonsignificant. The T×C interaction was nonsignificant ($\beta=0.15$, 95% CI [-0.03, 0.33], $p=0.11$, $\Delta R^2=0.02$; **Figure 2d**) and the direction of this effect was equivalent in males and females. The T×C×gender interaction was also nonsignificant ($<-0.01 < \beta < 0$, 95% CI [-0.17, 0.17], $p=0.97$, $\Delta R^2=0.05$).

Supplementary Information The online version contains supplementary material available at <https://doi.org/10.1007/s40750-021-00171-7>.

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