

Appendix from E. D. Ketterson et al., “Testosterone in Females: Mediator of Adaptive Traits, Constraint on Sexual Dimorphism, or Both?”

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Data Tables and Additional Literature Cited

Table A1

Data on mean female and male plasma levels of testosterone in birds

Species	Latin name	Order	Family	FNB	FPL	FL	FI	FO	MNB	MPL	ML	MI	MO	Reference
Brown kiwi	<i>Apteryx australis</i>	Struthioniformes	Apterygidae	.05	.25	.05	.05	.05	...	2.20	.30	.80	...	Potter and Cockrem 1992
Grey partridge	<i>Perdix perdix</i>	Galliformes	Phasianidae	...	1.20	...	...	...	...	1.50	...	...	...	Beani et al. 1988
Willow ptarmigan	<i>Lagopus lagopus</i>	Galliformes	Phasianidae	...	.05	.08	.07	.10	...	1.70	.10	.10	.10	Hannon and Wingfield 1990
Bar-headed goose	<i>Anser indicus</i>	Anseriformes	Anatidae	.30	.45	.60	.35	.35	...	3.20	1.50	1.00	.60	Dittami 1981
Mallard	<i>Anas platyrhynchos</i>	Anseriformes	Anatidae	.05	.20	.38	.05	.05	...	.40	.50	.15	.10	Donham 1979
Downy woodpecker	<i>Picoides pubescens</i>	Piciformes	Picidae	4.00	...	12.31	...	3.50	.05	5.00	10.14	...	3.00	Kellam et al. 2004
Black coucal	<i>Centropus grillii</i>	Cuculiformes	Centropodidae	...	.25	.60	...	...	...	.60	2.10	...	.65	Goymann and Wingfield 2004
Budgerigar	<i>Melopsittacus undulatus</i>	Psittaciformes	Psittacidae	.08	.10	.14	.06	.06	...	.45	.75	1.17	.85	Whitaker 1990
Rose-ringed parakeet	<i>Psittacula krameri</i>	Psittaciformes	Psittacidae	.56	.68	.67	...	...	.93	.68	...	...	...	Sailaja et al. 1988
Eurasian collared dove	<i>Streptopelia decaocto</i>	Columbiformes	Columbidae	.25	.33	.19	.13	.13	.27	2.09	...	.50	.41	Peczely and Pethes 1979
Spotted sandpiper	<i>Tringa macularia</i>	Ciconiiformes	Scolopacidae	.11	.63	...	...	.16	...	3.80	...	.40	.10	Fivizzani and Oring 1986
Semipalmated sandpiper	<i>Calidris pusilla</i>	Ciconiiformes	Scolopacidae	.04	.29	.70	.45	.10	.08	1.92	...	1.10	.23	Gratto-Trevor et al. 1990
Wilson's phalarope	<i>Phalaropus tricolor</i>	Ciconiiformes	Scolopacidae	...	.51	...	...	...	...	3.61	...	.63	...	Fivizzani et al. 1986
Red-necked phalarope	<i>Phalaropus lobatus</i>	Ciconiiformes	Scolopacidae	.01	.41	.20	.20	...	.01	4.00	.20	.20	...	Gratto-Trevor et al. 1990
Western gull	<i>Larus occidentalis</i>	Ciconiiformes	Laridae	...	.20	.30	.20	.10	...	2.50	.20	.35	.25	Wingfield et al. 1982
Harris's hawk	<i>Parabuteo unicinctus</i>	Ciconiiformes	Accipitridae	...	.08	.03	.02	.02	...	.40	.02	.02	.02	Mays et al. 1991
Red-tailed tropicbird	<i>Phaethon rubricauda</i>	Ciconiiformes	Phaethontidae	...	.50	...	.43	.02	...	.70	...	.35	.18	Lormee et al. 2000
Blue-footed booby	<i>Sula nebouxii</i>	Ciconiiformes	Sulidae	.19	.15	.55	...	.10	.28	.29	.45	...	.14	Wingfield et al. 1999
Masked booby	<i>Sula dactylatra</i>	Ciconiiformes	Sulidae	.01	.01	...	.18	.01	.02	.58	...	.01	.20	Lormee et al. 2000
Red-footed booby	<i>Sula sula</i>	Ciconiiformes	Sulidae	...	.06	...	.02	.04	.01	.08	...	.04	.04	Lormee et al. 2000
White ibis	<i>Eudocimus albus</i>	Ciconiiformes	Threskiornithidae	...	.88	.40	.50	.30	...	1.10	.43	.45	.50	Heath et al. 2003
King penguin	<i>Aptenodytes patagonicus</i>	Ciconiiformes	Spheniscidae	...	1.20	1.70	.50	...	...	5.00	...	.40	...	Mauget et al. 1994
Gentoo penguin	<i>Pygosceles papua</i>	Ciconiiformes	Spheniscidae	...	1.21	...	...	...	...	4.98	6.50	.66	.17	Williams 1992
Magellanic penguin	<i>Spheniscus magellanicus</i>	Ciconiiformes	Spheniscidae	...	.67	.08	.10	.10	...	2.80	...	.80	...	Fowler et al. 1994
Wandering albatross	<i>Diomedea exulans</i>	Ciconiiformes	Procellariidae	.50	...	2.30	.80	.40	...	4.50	...	1.50	...	Hector et al. 1986b
Black-browed albatross	<i>Diomedea melanophris</i>	Ciconiiformes	Procellariidae	...	1.60	.40	.50	...	.10	1.60	.10	.20	...	Hector et al. 1986a
Grey-headed albatross	<i>Diomedea chryostoma</i>	Ciconiiformes	Procellariidae	...	1.50	.40	.80	...	.10	1.90	.10	.10	...	Hector et al. 1986a

Table A1 (Continued)

Species	Latin name	Order	Family	FNB	FPL	FL	FI	FO	MNB	MPL	ML	MI	MO	Reference
Florida jay	<i>Aphelocoma coerulescens</i>	Passeriformes	Corvidae	.02	...	.03	.02	.02	...	1.20	.40	.10	.10	Schoech et al. 1991
Rook	<i>Corvus frugilegus</i>	Passeriformes	Corvidae	.46	.76	.28	.39	.29	.62	2.01	4.48	...	1.32	Peczely and Pethes 1982
European pied flycatcher	<i>Ficedula hypoleuca</i>	Passeriformes	Muscicapidae	...	.27	.10	.13	.10	...	1.60	.20	.18	.17	Silverin and Wingfield 1982
Common starling	<i>Sturnus vulgaris</i>	Passeriformes	Sturnidae	...	.27	.27	...	.11	.40	2.93	.71	.50	.20	M. Sandell and B. Silverin, unpublished data; Dawson 1983
Northern mockingbird	<i>Mimus polyglottos</i>	Passeriformes	Mimidae	.10	.40	...	.28	.12	.10	2.40	...	1.00	.80	Logan and Wingfield 1995
Willow tit	<i>Parus montanus</i>	Passeriformes	Paridae	...	.28	.17	.35	.13	...	1.33	1.27	.70	.36	Silverin et al. 1986
House sparrow	<i>Passer domesticus</i>	Passeriformes	Passeridae	...	.18	.30	.28	.16	...	5.90	...	.90	2.00	Hegner and Wingfield 1986
White-rumped munia	<i>Lonchura striata</i>	Passeriformes	Passeridae	.01	.22	.09	.10	.01	...	1.55	.09	.10	.08	Seiler et al. 1992
Lapland longspur	<i>Calcarius lapponicus</i>	Passeriformes	Fringillidae	...	.50	...	...	...	...	6.00	...	...	...	Hunt et al. 1995
Snow bunting	<i>Plectrophenax nivalis</i>	Passeriformes	Fringillidae	...	.25	.60	...	...	...	4.00	1.50	1.70	...	Romero et al. 1998
Song sparrow	<i>Melospiza melodia</i>	Passeriformes	Fringillidae	...	2.50	1.20	.40	.60	.50	5.00	5.50	1.50	1.50	Wingfield 1984
Dark-eyed junco	<i>Junco hyemalis</i>	Passeriformes	Fringillidae	...	3.80	.80	.60	.50	.90	6.20	2.90	.90	1.40	Ketterson et al. 2001
Red-winged blackbird	<i>Agelaius phoeniceus</i>	Passeriformes	Fringillidae	.01	.14	.07	...	.01	2.10	2.80	3.20	2.70	1.90	Cristol and Johnsen 1994
Brown-headed cowbird	<i>Molothrus ater</i>	Passeriformes	Fringillidae	.16	.21	.20	...	...	.65	.70	.50	...	...	Dufty and Wingfield 1986

Note: Data on mean female (F) and male (M) plasma levels of testosterone (ng/mL) employed in analysis of temporal variation in female testosterone and in analyses involving maximal male and female testosterone. We considered only published studies in which individuals were assigned to a specific stage of breeding; stage means were based on at least several individuals, and measurements were reported for at least three of five nonoverlapping stages of breeding (nonbreeding [NB], prelaying [PL], egg-laying [L], incubation [I], and feeding/care of offspring [O]). Quantities shown are mean ng/mL plasma testosterone. FNB = female, nonbreeding; FPL = female, prelaying; FL = female, laying; FI = female, incubation; FP = female, offspring care; MP = male, prelaying; ML = male, laying; MI = male, incubation; MO = male, offspring care.

Table A2
Data employed for analyses of female testosterone in relation to female ecology

Species	Latin name	Order	Family	BD	BS	P	MS	FT	FS	FA	F max	F max stage	M max	M max stage	M/F ratio	Reference
Brown kiwi	<i>Apteryx australis</i>	Struthioniformes	Apterygidae	0	2	1	1	Moderate	0	Low	.25	Laying	2.2	Prelay	8.8	Potter and Cockrem 1992
Grey partridge	<i>Perdix perdix</i>	Galliformes	Phasianidae	0	2	1	1	Moderate	0	Moderate	1.2	Prelay	1.5	Prelay	1.25	Beani et al. 1988
Willow ptarmigan	<i>Lagopus lagopus</i>	Galliformes	Phasianidae	0	1	1	1	Moderate	0	Moderate	.1	Nestling	1.7	Prelay	17	Hannon and Wingfield 1990
Greylag goose	<i>Anser anser</i>	Anseriformes	Anatidae	0	2	1	1	Low	0	Low	10	Prelay	38	Prelay	3.8	Hirschenhauser et al. 1999
Bar-headed goose	<i>Anser indicus</i>	Anseriformes	Anatidae	0	1	1	1	Low	0	Low	.6	Laying	3.2	Prelay	5.333	Dittami 1981
Mallard	<i>Anas platyrhynchos</i>	Anseriformes	Anatidae	1	2	3	2	Low	0	Low	.38	Laying	.65	Early incubation	1.711	Donham 1979
Downy woodpecker	<i>Picoides pubescens</i>	Piciformes	Picidae	0	1	2	1	Low	0	Low	12.3	Laying	10.14	Laying	.824	Kellam et al. 2004
Black coucal	<i>Centropus grillii</i>	Cuculiformes	Centropodidae	0	2	1	3	High	1	High	.6	Laying	2.1	Laying	3.5	Goymann and Wingfield 2004
Budgerigar	<i>Melopsittacus undulatus</i>	Psittaciformes	Psittacidae	1	1	2	1	Moderate	0	High	.14	Laying	1.169	Early incubation	8.175	Whitaker 1990
Rose-ringed parakeet	<i>Psittacula krameri</i>	Psittaciformes	Psittacidae	1	1	2	1	Low	0	Low	.68	Prelay	.929	Prelay	1.374	Sailaja et al. 1988
Eurasian collared-dove	<i>Streptopelia decaocto</i>	Columbiformes	Columbidae	0	2	1	1	Low	1	Low	.33	Prelay	2.09	Prelay	6.333	Peczely and Pethes 1979
Spotted sandpiper	<i>Tringa macularia</i>	Ciconiiformes	Scolopacidae	0	2	1	3	High	0	High	.63	Laying	3.8	Prelay	6.032	Fivizzani and Oring 1986
Semipalmated sandpiper	<i>Calidris pusilla</i>	Ciconiiformes	Scolopacidae	0	2	1	1	Moderate	0	Moderate	.7	Laying	1.92	Prelay	2.743	Gratto-Trevor et al. 1990
Wilson's phalarope	<i>Phalaropus tricolor</i>	Ciconiiformes	Scolopacidae	0	3	3	3	Low	0	High	.51	Prelay	3.608	Prelay	7.075	Fivizzani et al. 1986
Red-necked phalarope	<i>Phalaropus lobatus</i>	Ciconiiformes	Scolopacidae	0	2	3	3	Low	0	Moderate	.41	Prelay	4	Prelay	9.756	Gratto-Trevor et al. 1990
Western gull	<i>Larus occidentalis</i>	Ciconiiformes	Laridae	1	2	1	1	High	0	High	.3	Laying	.35	Prelay	1.167	Wingfield et al. 1982
Harris's hawk	<i>Parabuteo unicinctus</i>	Ciconiiformes	Accipitridae	1	2	1	4	Low	0	Low	.08	Laying	.45	Laying	5.625	Mays et al. 1991
Red-tailed tropicbird	<i>Phaethon rubricauda</i>	Ciconiiformes	Phaethontidae	1	2	1	1	Low	0	Low	.5	Prelay	.7	Prelay	1.4	Lormee et al. 2000
Masked booby	<i>Sula dactylatra</i>	Ciconiiformes	Sulidae	1	1	1	1	Low	0	Low	.18	Incubation	.575	Prelay	3.194	Lormee et al. 2000
Blue-footed booby	<i>Sula nebouxii</i>	Ciconiiformes	Sulidae	1	2	1	1	Low	0	Low	.55	Laying	.45	Laying	.818	Wingfield et al. 1999
Red-footed booby	<i>Sula sula</i>	Ciconiiformes	Sulidae	1	2	1	1	Low	0	Low	.06	Laying	.08	Prelay	1.333	Lormee et al. 2000
White ibis	<i>Eudocimus albus</i>	Ciconiiformes	Threskiornithidae	1	3	1	1	Low	0	Low	.88	Prelay	1.1	Prelay	1.257	Heath et al. 2003
King penguin	<i>Aptenodytes patagonicus</i>	Ciconiiformes	Spheniscidae	1	1	1	1	Low	0	Low	1.7	Laying	5	Prelay	2.941	Mauget et al. 1994

Table A2 (Continued)

Species	Latin name	Order	Family	BD	BS	P	MS	FT	FS	FA	F max	F max stage	M max	M max stage	M/F ratio	Reference
Gentoo penguin	<i>Pygoscelis papua</i>	Ciconiiformes	Spheniscidae	1	2	1	1	Low	0	Low	1.21	Laying	6.5	Laying	5.372	Williams 1992
Magellanic penguin	<i>Spheniscus magellanicus</i>	Ciconiiformes	Spheniscidae	1	1	1	1	Low	0	Low	.67	Prelay	2.8	Prelay	4.179	Fowler et al. 1994
Wandering albatross	<i>Diomedea exulans</i>	Ciconiiformes	Procellariidae	1	2	1	1	Low	0	Low	2	Laying	4.5	Laying	2.25	Hector et al. 1986b
Black-browed albatross	<i>Diomedea melanophris</i>	Ciconiiformes	Procellariidae	1	1	1	1	Moderate	0	Moderate	1.6	Prelay	1.6	Prelay	1	Hector et al. 1986a
Grey-headed albatross	<i>Diomedea chrysostoma</i>	Ciconiiformes	Procellariidae	1	1	1	1	Moderate	0	Moderate	1.5	Prelay	1.9	Prelay	1.267	Hector et al. 1986a
Bell miner	<i>Manorina melanophrys</i>	Passeriformes	Meliphagidae	0	2	1	4	Moderate	0	Moderate	.65	Breeding	.57	Breeding	.877	Poiani and Fletcher 1994
Florida jay	<i>Aphelocoma coerulescens</i>	Passeriformes	Corvidae	0	1	1	4	Moderate	0	Low	.08	Prelay	.4	Laying	5	Schoech et al. 1991
Rook	<i>Corvus frugilegus</i>	Passeriformes	Corvidae	1	2	1	1	Low	0	Low	.76	Prelay	4.48	Laying	5.918	Peczely and Pethes 1982
European pied flycatcher	<i>Ficedula hypoleuca</i>	Passeriformes	Muscicapidae	0	1	3	1	Low	0	Low	.27	Prelay	1.6	Prelay	5.926	Silverin and Wingfield 1982
Common starling	<i>Sturnus vulgaris</i>	Passeriformes	Sturnidae	1	1	2	2	Moderate	1	High	.27	Prelay	2.93	Prelay	10.85	M. Sandell and B. Silverin, unpublished data; Dawson 1983
Northern mockingbird	<i>Mimus polyglottos</i>	Passeriformes	Mimidae	0	2	1	1	High	0	High	.4	Prelay	2.4	Prelay	6	Logan and Wingfield 1995
Willow tit	<i>Parus montanus</i>	Passeriformes	Paridae	0	1	1	1	Low	0	Low	.35	Incubation	1.33	Prelay	3.833	Silverin et al. 1986
House sparrow	<i>Passer domesticus</i>	Passeriformes	Passeridae	1	2	1	1	Moderate	0	Moderate	.3	Laying	5.9	Prelay	19.67	Hegner and Wingfield 1986
White-browed sparrow-weaver	<i>Plocepasser mahali</i>	Passeriformes	Passeridae	1	1	1	4	Moderate	0	Moderate	.05	Breeding	.1	Breeding	2	Wingfield and Lewis 1993
White-rumped munia	<i>Lonchura striata</i>	Passeriformes	Passeridae	1	1	1	1	Low	0	Low	.22	Prelay	1.55	Prelay	7.045	Seiler et al. 1992
Lapland longspur	<i>Calcarius lapponicus</i>	Passeriformes	Fringillidae	0	1	3	1	Low	0	Low	.5	Prelay	6	Prelay	12	Hunt et al. 1995
Snow bunting	<i>Plectrophenax nivalis</i>	Passeriformes	Fringillidae	1	1	3	1	Low	0	Moderate	.6	Laying	4	Prelay	6.667	Romero et al. 1998
Song sparrow	<i>Melospiza melodia</i>	Passeriformes	Fringillidae	0	2	1	1	High	1	High	2.5	Prelay	5.6	Prelay	2.24	Wingfield 1984
Dark-eyed junco	<i>Junco hyemalis</i>	Passeriformes	Fringillidae	0	1	1	1	Low	1	Moderate	3.8	Prelay	6.2	Prelay	1.632	Ketterson et al. 2001

Table A2 (Continued)

Species	Latin name	Order	Family	BD	BS	P	MS	FT	FS	FA	F max	F max stage	M max	M max stage	M/F ratio	Reference
Red-winged blackbird	<i>Agelaius phoeniceus</i>	Passeriformes	Fringillidae	0	3	3	2	Moderate	1	High	.14	Prelay	3.1	Laying	22.14	Cristol and Johnsen 1994
Brown-headed cowbird	<i>Molothrus ater</i>	Passeriformes	Fringillidae	1	2	2	1	Low	1	Moderate	.21	Prelay	.7	Prelay	3.333	Dufty and Wingfield 1986

Note: BD: breeding density, 0 = dispersed, 1 = aggregated; BS: body size, 1 = 80%–100% overlap between the sexes, 2 = 5%–80% overlap between the sexes, 3 = no overlap between the sexes; P: plumage and other forms of sexual dimorphism, 1 = monomorphic plumage, 2 = moderate dimorphism (e.g., eye, beak, leg color), 3 = great dimorphism; MS: mating system, social, 1 = monogamous, 2 = polygynous, 3 = polyandrous, 4 = cooperative; FT: female territoriality and nest defense, low = females do not engage in territorial defense, moderate = females may defend nest site but with lower intensity than males, high = females engage in territorial defense or defense of nest site; FS: female song, 0 = females do not sing, 1 = females are known to sing; FA: female aggression, low = females do not express aggressive behavior during reproduction, moderate = females may show intrasexual aggression but at very low frequency, high = females are known to be aggressive, mainly intrasexual aggression. F max = mean value (ng/mL) of female testosterone at maximum stage; F max stage = stage of reproduction when mean female testosterone at its maximum (see table A1 for value of female testosterone during that stage); M max = mean value (ng/mL) of male testosterone at maximum stage; male max stage = stage of reproduction when male testosterone at its maximum; M/F ratio = ratio of male max to female max.

Table A3

A partial review of traits in females that are sensitive or insensitive to experimentally altered androgens

Effect	Species	Latin name	Reference
Sensitive traits:			
Fish:			
Preparation for reproduction	Fish, midshipman	<i>Porichthys notatus</i>	Sisneros et. al. 2004
Masculinizes sonic muscle	Fish, midshipman	<i>Porichthys notatus</i>	Brantley et al. 1993
Circadian rhythms, EOD	Electric fish	<i>Brachyhypopomus pinnicaudatus</i>	Stoddard, forthcoming
Circadian rhythms, EOD	Rainbow trout	<i>Oncorhynchus mykiss</i>	
Amphibians:			
Enhance ovarian weight	Frog	<i>Rana pipiens</i>	Dubowsky and Smalley 1993
Laryngeal muscle, secondary sex	African clawed frog	<i>Xenopus</i>	Sassoon and Kelley 1986
Reptiles:			
Aggression	Mountain spiny lizard	<i>Sceloporus jarrovi</i>	Woodley and Moore 1999
Birds:			
Morphology:			
Enlargement, frontal shield	Common moorhen	<i>Gallinula chloropus</i>	Eens et al. 2000
Bill color	European starling	<i>Sturnus vulgaris</i>	DeRidder et al. 2002
Color of bill ornament	Budgerigar	<i>Melopsittacus undulatus</i>	Nespor et al. 1996
Male-like plumage	Ruff	<i>Philomachus pugnax</i>	Lank et al. 1999
Enhanced muscle mass	Ruff	<i>Philomachus pugnax</i>	Lank et al. 1999
Reduced body mass	Dark-eyed junco	<i>Junco hyemalis</i>	Clotfelter et al. 2004
Enhanced body mass	Common moorhen	<i>Gallinula chloropus</i>	Eens et al. 2000
Behavior:			
Aggression	Zebra finch	<i>Poephila guttata</i>	Adkins-Regan 1999
Aggression	Red-winged blackbird	<i>Agelaius phoeniceus</i>	Searcy 1988
Social status	Spotless starling	<i>Sturnus unicolor</i>	Veiga et al. 2004
Threat displays	Black-headed gull	<i>Larus ridibundus</i>	Groothuis and Meeuwissen 1992
Vocal behavior, song	Various species		Catchpole and Slater 1995; Langmore 1998
Vocal behavior, crowing	Japanese quail	<i>Coturnix japonica</i>	Adkins and Adler 1972; Balthazart et al. 1984
Vocal behavior, song	Budgerigar	<i>Melopsittacus undulatus</i>	Nespor et al. 1996
Vocal behavior, song	European robin	<i>Erithacus rubecula</i>	Kriner and Schwabl 1991
Vocal behavior, song	European starling	<i>Sturnus vulgaris</i>	Hausberger et al. 1995; DeRidder et al. 2002
Vocal behavior, song	Chestnut-sided warbler	<i>Dendroica pensylvanica</i>	Byers and King 2000
Vocal behavior, song	Dark-eyed junco	<i>Junco hyemalis</i>	I. Parker-Renga, K. Jones, and E. Ketterson, unpublished manuscript; Konishi 1964
Vocal behavior, song	White-crowned sparrow	<i>Zonotrichia leucophrys</i>	Kern and King 1972
Vocal behavior, song	Song sparrow	<i>Melospiza melodia</i>	Arcese et al. 1988
Vocal behavior, song	Zebra finch	<i>Poephila guttata</i>	Adkins-Regan 1999
Vocal behavior, song	House finch	<i>Carpodacus mexicanus</i>	Bitterbaum and Baptista 1979
Song, vocal control nuclei	Canary	<i>Serinus canaria</i>	Nottebohm 1980
Song, innervation	Canary	<i>Serinus canaria</i>	Appeltants et al. 2003
Courtship	Ruff	<i>Philomachus pugnax</i>	Lank et al. 1999
Courtship	Budgerigar	<i>Melopsittacus undulatus</i>	Nespor et al. 1996
Circadian rhythm, incubation	Ring dove	<i>Streptopelia risoria</i>	Ramos and Silver 1972
Partner preference	Zebra finch	<i>Poephila guttata</i>	Adkins-Regan and Wade 2001
Partner discrimination	Dark-eyed junco	<i>Junco hyemalis</i>	McGlothlin et al. 2004
Physiology:			
Delayed breeding	European starling	<i>Sturnus vulgaris</i>	M. Sandell, unpublished manuscript
Delayed breeding	Red-winged blackbird	<i>Agelaius phoeniceus</i>	Searcy 1988
Delayed breeding	Dark-eyed junco	<i>Junco hyemalis</i>	Clotfelter et al. 2004
Delayed molt	European starling	<i>Sturnus vulgaris</i>	DeRidder et al. 2002
Delayed molt	Dark-eyed junco	<i>Junco hyemalis</i>	Clotfelter et al. 2004
Ectoparasite load	Common moorhen	<i>Gallinula chloropus</i>	Eens et al. 2000
Infection with staphylococcus	European starling	<i>Sturnus vulgaris</i>	DeRidder et al. 2002
Immune, LPS, and PHA	European starling	<i>Sturnus vulgaris</i>	Duffy et al. 2000
Immune, PHA	Dark-eyed junco	<i>Junco hyemalis</i>	Zysling et al. 2003

Table A3 (Continued)

Effect	Species	Latin name	Reference
Offspring sex ratio	Spotless starling	<i>Sturnus unicolor</i>	Veiga et al. 2004
Mammals:			
Morphology:			
Secondary sex characteristic	Red deer	<i>Cervus elaphus</i>	Li et al. 2003
Secondary sex characteristic	White-tailed deer	<i>Odocoileus virginianus</i>	Wislocki et al. 1947
Simulate reproductive development	Rat	<i>Rattus rattus</i>	Gonzalez-Diddi et al. 1972
Behavior:			
Masculine copulatory behavior	Mouse	<i>Mus musculus</i>	Edwards 1971, cited in Rissman et al. 1999
Attractiveness to males	Rat	<i>Rattus rattus</i>	DeJonge et al. 1986
Same-sex partner preference	Rat	<i>Rattus rattus</i>	Slob et al. 1987; von Esenwein 2003
Scent marking	Rat	<i>Rattus rattus</i>	Brown 1978
Scent marking	Mongolian gerbil	<i>Meriones unguiculatus</i>	Owen and Thiessen 1971; Thiessen et al. 1971, cited in Brown 1978
Odor detection	Rat	<i>Rattus rattus</i>	Pietras and Moulton 1974
Sexual motivation	Rat	<i>Rattus rattus</i>	Myerson et al. 1973
Sexuality	Human	<i>Homo sapiens</i>	Bancroft et al. 1980; Sherwin et al. 1985; Sherwin and Gelfand 1987; Myers et al. 1990; Shifren et al. 2000; Tuiten et al. 2000; Bancroft 2003
Aggression	Human	<i>Homo sapiens</i>	Sherwin and Gelfand 1985
Anger, aggression, female to male transsexual	Human	<i>Homo sapiens</i>	Van Goozen et al. 1994, 1995
Insensitive traits:			
Birds:			
Morphology:			
Secondary sex characteristics, ornaments	Ruff	<i>Philomachus pugnax</i>	Lank et al. 1999
Body mass	European starling	<i>Sturnus vulgaris</i>	DeRidder et al. 2002
Behavior:			
Aggression	European starling	<i>Sturnus vulgaris</i>	DeRidder et al. 2002
Aggression	European robin	<i>Erithacus rubecula</i>	Kriner and Schwabl 1991
Vocal behavior, context	European starling	<i>Sturnus vulgaris</i>	DeRidder et al. 2002
Partner preference	Zebra finch	<i>Poephila guttata</i>	Adkins-Regan 1999; Mansukhani et al. 1996
Partner preference	Budgerigar	<i>Melopsittacus undulatus</i>	Nespor 2000; Nespor et al. 2000
Incubation behavior	Dark-eyed junco	<i>Junco hyemalis</i>	Clotfelter et al. 2004
Incubation behavior	European starling	<i>Sturnus vulgaris</i>	Sandell et al., unpublished manuscript
Physiology:			
Immune function	European starling	<i>Sturnus vulgaris</i>	DeRidder et al. 2002
Immune function	Common moorhen	<i>Gallinula chloropus</i>	Eens et al. 2000
Immune function	European starling	<i>Sturnus vulgaris</i>	Sandell, unpublished manuscript
Mammals:			
Partner preference	Sika deer	<i>Cervus nippon</i>	
Secondary sex characteristics	Red deer	<i>Cervus elaphus</i>	Jaczewski et al. 1976
Secondary sex characteristics	Human	<i>Homo sapiens</i>	Bancroft 2003

Note: EOD = electric organ discharge, LPS = lipopolysaccharide, PHA = phytohemagglutinin.

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