Supplementary Material

TABLE S1 Selected studies of migratory songbirds (Order Passeriformes) with statistical evidence of sex-specific departure timing and traits related to migration speed during spring migration. Effect directions are presented for all traits. Effect sizes are presented for timing and speed traits; effect size = NA for other traits. The em-dash indicates that estimates were not reported.

Trait and type of data	Effect direction	Effect size (M-F)	Species	Notes	Source
Departure date (d)					
Mark-recapture	M < F	-6,-8 d	*Saxicola rubetra*	Estimates from two statistical models	(Risely et al., 2015)
Mark-recapture	M = F	—	*Setophaga ruticilla*	1995, forest and scrub 1996, scrub	(Marra et al., 1998)
	M < F	—		1996, forest	
Geolocator or PTT-tags	M < F	-3 d	8 passerines and 6 near-passerines	Meta-analysis	(Briedis et al., 2019)
Geolocator	M = F	—	*Ficedula albicollis*		(Briedis et al., 2016b)
Geolocator	M < F	-14 d	*Ficedula hypoleuca*		(Ouwehand and Both, 2017)
Geolocator	M < F	-4.5,-8 d	*Ficedula semitorquata*	Estimates for two years, extracted from figure	(Briedis et al., 2017)
Geolocator	M = F	3.3 d	*Hirundo rustica*		(Liechti et al., 2015)
Geolocator	M < F	—	*Hylocichla mustelina*		(Stanley et al., 2012)
Geolocator	M < F	-14 d	*Oenanthe oenanthe oenanthe*		(Schmaljohann et al., 2016)
Geolocator	M < F	-14 d	*Tachycineta bicolor*		(Gow et al., 2019)
Zugunruhe	M < F	-38 d	*Phoenicurus phoenicurus*		(Coppack and Pulido, 2009)
Zugunruhe	M = F	—	*Junco hyemalis*		(Ketterson and Nolan, 1985)
Zugunruhe	M < F	-17 d	*Oenanthe oenanthe*		(Maggini and Bairlein, 2012)
Zugunruhe	M < F	-5 d	*Saxicola* spp.		(Van Doren et al., 2017)
Zugunruhe	M < F	-5,-8 d	*Setophaga caerulescens*	Estimates for two variables	(Deakin et al., 2019)
Zugunruhe	M < F	-7 d	*Sylvia atricapilla*		(Terrill and Berthold, 1990)
Radio-telemetry	M < F	-12 d	*Catharus ustulatus*		(McElaney, 2019)

Migration speed (km·d^{-1})					
Geolocator or PTT-tags	M = F	—	8 passerines and 6 near-passerines	Meta-analysis	(Briedis et al., 2019)
Geolocator	M = F	—	*Lanius collurio*		(Tøttrup et al., 2012)
Geolocator	M = F	-1.2 km·d^{-1}	*Oenanthe oenanthe oenanthe*		(Schmaljohann et al., 2016)
Migration duration (d)					
Geolocator or PTT-tags	M < F	—	8 passerines and 6 near-passerines	Meta-analysis	(Briedis et al., 2019)
Geolocator	M = F	0.5 d	*Oenanthe oenanthe oenanthe*		(Schmaljohann et al., 2016)
Wing shape					
Pointedness	M = F	NA	*Catharus ustulatus*		(Bowlin, 2007)
Pointedness	M > F	NA	*Hirundo rustica*		(Saino et al., 2017)
Pointedness	M > F	NA	*Junco hyemalis*		(Chandler and Mulvihill, 1990)
Pointedness	M > F	NA	*Luscinia svecica*		(Arizaga et al., 2006)
Pointedness	M > F M = F	NA	*Oenanthe oenanthe leucorhoa* *Oenanthe oenanthe oenanthe*		(Schmaljohann et al., 2016)
Pointedness	M > F	NA	*Phylloscopus trochilus*		(Hedenström and Pettersson, 1986)
Kipp's distance Distal distance	M > F	NA	*Saxicola torquata*	Interpreted as a sexually selected trait	(Baldwin et al., 2010)
Flight speed					
Geolocator	M > F	—	*Lanius collurio*		(Tøttrup et al., 2012)
Fueling rate					
Mass change	M > F	NA	*Cardellina pusilla*		(Yong et al., 1998)
Mass change	M = F	NA	*Geothlypis trichas*		(Morris et al., 2003)
Mass change	M = F	NA	*Mniotilta varia* *Setophaga coronata* *Setophaga fusca* *Setophaga magnolia* *Setophaga ruticilla* *Setophaga virens*	Some evidence for M ≠ F in late season *S. ruticilla*.	(Smith et al., 2007)
Mass change	M = F	NA	*Setophaga ruticilla*		(Morris and Glasgow, 2001)

Plasma metabolites	M = F	NA	*Cardellina pusilla*	(Hays et al., 2018)
Plasma metabolites	M > F	NA	*Geothlypis trichas* *Setophaga coronata*	(Seewagen et al., 2013)
Plasma metabolites	M = F	NA	*Geothlypis trichas* *Setophaga magnolia* *Setophaga ruticilla*	(Morbey et al., 2018)
Plasma metabolites	M = F	NA	*Setophaga coronata* *Setophaga magnolia*	(MacDade et al., 2011)
Plasma metabolites	M = F	NA	*Zonotrichia albicollis*	(Beauchamp, 2018)
Ad libitum fat deposition rate	M > F	NA	*Oenanthe oenanthe leucorhoa*	(Schmaljohann et al., 2016)
Ad libitum fat deposition rate	M = F	NA	*Oenanthe oenanthe oenanthe*	(Dierschke et al., 2005;Schmaljohann et al., 2016)
Stopover duration (d)				
Mark-capture	M = F	1 d	*Setophaga ruticilla*	(Morris and Glasgow, 2001)
Mark-capture	M = F	1 d	*Geothlypis trichas*	(Morris et al., 2003)
Geolocator	M = F	—	*Lanius collurio*	(Tøttrup et al., 2012)
Radio-telemetry	M = F	—	*Setophaga caerulescens* *Setophaga magnolia*	(Morbey et al., 2018)
Radio-telemetry	M = F	—	*Setophaga coronata* *Setophaga ruticilla*	(Dossman et al., 2016)
Radio-telemetry	M = F	-1 d	*Zonotrichia albicollis*	(Beauchamp, 2018)

TABLE S2 Selected studies of migratory songbirds (Order Passeriformes) with statistical evidence of age-specific departure timing and traits related to migration speed during spring migration. Each detected effect direction is reported once per study. Effect sizes are presented for timing and speed traits; effect size = NA for other traits. The em-dash indicates that estimates were not reported.

Trait and type of data	Effect direction	Effect size (A-J)	Species	Notes	Source
Departure date (d)					
Zugunruhe	A > J	5 d	*Saxicola* spp.		(Van Doren et al., 2017)
Geolocator	A < J	-8 d	*Hylocichla mustelina*		(McKinnon et al., 2014)
Radio-telemetry	A = J	4 d	*Catharus ustulatus*		(McElaney, 2019)
Migration speed (km·d^{-1})					
Geolocator data	A > J	80 km·d^{-1}	*Hylocichla mustelina*		(McKinnon et al., 2014)
Migration duration (d)					
Geolocator data	A < J	-8 d	*Hylocichla mustelina*		(McKinnon et al., 2014)
Wing shape					
Pointedness	A > J	NA	*Sylvia atricapilla* (migratory)	Significant in females	(Pérez-Tris and Tellería, 2001)
Pointedness	A > J	NA	*Ficedula albicollis* *Periparus ater*		(Alatalo et al., 1984)
Pointedness	A > J	NA	*Sylvia atricapilla* (migratory)		(Fiedler, 2005)
Pointedness	A > J	NA	*Hirundo rustica*		(Saino et al., 2017)
Kipp's distance	A = J	NA	*Saxicola torquata*		(Baldwin et al., 2010)
Distal distance	A > J	NA			
Fueling rate					
Mass change	A = J	NA	*Geothlypis trichas*		(Morris et al., 2003)
Mass change	A = J	NA	*Setophaga ruticilla*		(Morris and Glasgow, 2001)
Plasma metabolites	A = J	NA	*Setophaga coronata* *Setophaga magnolia* *Setophaga ruticilla*		(Morbey et al., 2018)
Plasma metabolites	A = J	NA	*Zonotrichia albicollis*		(Beauchamp, 2018)
Ad libitum fat deposition rate	A = J	NA	*Oenanthe oenanthe*		(Schmaljohann et al., 2018)

Stopover duration (d)					
Mark-recapture	A < J	-5 d	*Acrocephalus scirpaceus*		(Rguibi-Idrissi et al., 2003)
Mark-recapture	A < J	—	*Catharus guttatus* *Catharus ustulatus* *Regulus calendula* *Setophaga magnolia* *Zonotrichia albicollis*		(MacKenzie, 2010)
Mark-recapture	A = J	—	*Geothlypis trichas*		(Morris et al., 2003)
Mark-recapture	A = J	—	*Setophaga ruticilla*		(Morris and Glasgow, 2001)
Geolocator	A = J	0 d	*Hylocichla mustelina*	But juveniles had more stopover days during their migration	(McKinnon et al., 2014)
Radio-telemetry	A < J	—	*Setophaga caerulescens* *Setophaga magnolia*		(Morbey et al., 2018)
Radio-telemetry	A < J	—	*Setophaga coronata coronata* *Setophaga ruticilla*		(Dossman et al., 2016)

TABLE S3 Selected studies of migratory songbirds (Order Passeriformes) with data on species-specific migration distance and other migration traits.

Species	n	Mass (g)	Breeding latitude	Departure day of year	Spring migration speed ($km \cdot d^{-1}$)	Migration distance (km)	Source
Acrocephalus arundinaceus	6	27	59.2	102	220	7083	(Lemke et al., 2013)
Agropsar philippensis	4	47	38.0	84	173	4583	(Koike et al., 2016)
Anthus campestris	4	25	50.5	82	137	4512	(Briedis et al., 2016a)
Calcarius ornatus	4	19	49.2	74	62	2429	(Ellison et al., 2017)
Carpodacus erythrinus	3	26	56.8	105	204	6428	(Stach et al., 2016)
Catharus fuscescens (Western)	9	43	49.6	107	246	7414	(Hobson and Kardynal, 2015)
Catharus ustulatus	28	35	50.3	97	143	6970	(Delmore and Irwin, 2014)
Emberiza hortulana	6	24	63.8	97	158	6080	(Selstam et al., 2015)
Ficedula hypoleuca	9	13	55	95	318	5551	(Ouwehand et al., 2016)
Ficedula semitorquata	10	13	42.9	49	114	5410	(Briedis et al., 2016c)
Hirundo rustica	5	20	46.8	83	262	11288	(Hobson et al., 2015)
Hylocichla mustelina	9	52	41.5	103	200	3484	(Conway and Eddleman, 1994;Stanley et al., 2012)
Lanius collurio	5	28	56	88	190	11862	(Tøttrup et al., 2012)
Linaria cannabina	5	21	54.2	65	124	1496	(Röseler et al., 2017)
Luscinia megarhynchos	9	20	45.1	84	161	4175	(Emmenegger et al., 2014)
Oenanthe oenanthe	8	26	67.1	95	230	15000	(Schmaljohann et al., 2017)
Phoenicurus phoenicurus	7	15	55.9	88	204	5040	(Kristensen et al., 2013)
Plectrophenax nivalis	18	40	64	126	120	2147	(McKinnon et al., 2016)
Riparia riparia	4	13	48.2	118	348	4438	(Szep et al., 2017)
Saxicola rubetra	13	13	52.0	104	141	5049	(Risely et al., 2015;Blackburn et al., 2019)
Setophaga kirtlandii	5	14	44.5	115	144	2207	(Ewert et al., 2012)
Setophaga striata	3	15	43.4	121	176	3900	(DeLuca et al., 2015)
Tyrannus tyrannus	8	41	40.8	110	277	5220	(Jahn et al., 2013)
Vermivora chrysoptera	6	9	47.5	104	119	3878	(Larkin et al., 2017)
Vireo olivaceus	10	17	41.8	117	146	6631	(Callo et al., 2013)

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