
References

A

- Abdelnabi, M. A., Bakst, M. R., Woods, J. E. & Ottinger, M. A. 2000. Plasma 17 β -estradiol levels and ovarian interstitial cell structure in embryonic Japanese quail. *Poultry Science*, **79**, 564-567.
- Abdelnabi, M. A. & Ottinger, M. A. 2003. Hypothalamic indolamines during embryonic development and effects of steroid exposure. *General and Comparative Endocrinology*, **130**, 13-19.
- Adkins, E. K. 1975. Hormonal basis of sexual differentiation in Japanese quail. *Journal of Comparative and Physiological Psychology*, **89**, 61-71.
- Adkins, E. K. 1979. Effect of embryonic treatment with estradiol or testosterone on sexual differentiation of the quail brain - critical period and dose-response relationships. *Neuroendocrinology*, **29**, 178-185.
- Adkins-Regan, E. 1981. Early organizational effects of hormones. An evolutionary perspective. In: Adler, N. T. (ed) *Neuroendocrinology of Reproduction*. New York: Plenum Press.
- Adkins-Regan, E. 1985. Exposure to embryos to an aromatisation inhibitor increases copulatory behaviour of male quail. *Behavioural Processes*, **11**, 153-158.
- Adkins-Regan, E. 1999. Testosterone increases singing and aggression but not male-typical sexual partner preference in early estrogen treated female zebra finches. *Hormones and Behavior*, **35**, 63-70.
- Adkins-Regan, E. 2002. Development of sexual partner preference in the zebra finch: a socially monogamous, pair-bonding animal. *Archives of Sexual Behavior*, **31**, 27-33.
- Adkins-Regan, E., Mansukhani, V., Thompson, R. & Yang, S. 1997. Organizational actions of sex hormones on sexual partner preference. *Brain Research Bulletin*, **44**, 497-502.
- Adkins-Regan, E., Ottinger, M. A. & Park, J. 1995. Maternal transfer of estradiol to egg yolks alters sexual differentiation of avian offspring. *Journal of Experimental Zoology*, **271**, 466-470.
- Adkins-Regan, E., Pickett, P. & Koutnik, D. 1987. Sexual differentiation in quail: conversion of androgen to estrogen mediates testosterone-induced demasculinization of copulation but not other male characteristics. *Hormones and Behavior*, **16**, 259-278.
- Adkins-Regan, E., Yang, S. & Mansukhani, V. 1996. Behavior of male and female zebra finches treated with an estrogen synthesis inhibitor as nestlings. *Behaviour*, **1996**, 847-862.

PROXIMATE CONTROL OF AVIAN SEX ALLOCATION

- Agate, R. J., Grisham, W., Wade, J., Mann, S., Wingfield, J., Schanen, C., Palotie, A. & Arnold, A. P. 2003. Neural, not gonadal, origin of brain sex differences in a gynandromorphic finch. *Proceedings of the National Academy of Sciences of the United States of America*, 100, 4873-4878.
- Andersson, M. 1994. *Sexual Selection*. Princeton: Princeton University Press.
- Ankney, C. D. 1982. Sex-ratio varies with egg sequence in lesser snow geese. *Auk*, 99, 662-666.
- Appleby, B. M., Petty, S. J., Blakey, J. K., Rainey, P. & MacDonald, D. W. 1997. Does variation of sex ratio enhance reproductive success of offspring in tawny owls (*Strix aluco*)? *Proceedings of the Royal Society of London. Series B: Biological Sciences*, 264, 1111-1116.
- Arcos, M. 1972. Steroids in egg-yolk. *Steroids*, 19, 25-34.
- Arnold, A. P. 1975. Effects of castration and androgen replacement on song, courtship, and aggression in zebra finches (*Poephila-Guttata*). *Journal of Experimental Zoology*, 191, 309-325.
- Arnold, A. P. 1997a. Experimental analysis of sexual differentiation of the zebra finch brain. *Brain Research Bulletin*, 44, 503-507.
- Arnold, A. P. 1997b. Sexual differentiation of the zebra finch song system: Positive evidence, negative evidence, null hypotheses, and a paradigm shift. *Journal of Neurobiology*, 33, 572-584.
- Arnold, K. E., Griffiths, R., Stevens, D. J., Orr, K. J., Adam, A. & Houston, D. C. 2003. Subtle manipulation of egg sex ratio in birds. *Proceedings of the Royal Society of London Series B: Biological Sciences*, 270, S216-S219.
- Aste, N., Balthazart, J., Absil, P., Grossmann, R., Mulhbauer, E., Viglietti-Panzica, C. & Panzica, G. C. 1998. Anatomical and neurochemical definition of the nucleus of the stria terminalis in Japanese quail (*Coturnix japonica*). *Journal of Comparative Neurology*, 396, 141-157.
- Aste, N., Panzica, G. C., Viglietti-Panzica, C. & Balthazart, J. 1991. Effects of in ovo estradiol benzoate treatments on sexual-behavior and size of neurons in the sexually dimorphic medial preoptic nucleus of Japanese-quail. *Brain Research Bulletin*, 27, 713-720.

B

- Balthazart, J. & Adkins-Regan, E. 2002. Sexual differentiation of brain and behavior in birds. In: Pfaff, D., Arnold, A. P., Etgen, A., Fahrbach, S., Moss, R. & Rubin, R. (eds) *Hormones, Brain and Behaviour*. San Diego.: Academic Press.
- Balthazart, J. & Ball, G. F. 1995. Sexual differentiation of brain and behavior in birds. *Trends in Endocrinology and Metabolism*, 6, 21-29.
- Balthazart, J., Declerck, A. & Foidart, A. 1992. Behavioral demasculinization of female quail is induced by estrogens - studies with new aromatase inhibitor, R76713. *Hormones and Behavior*, 26, 179-203.
- Balthazart, J., Tlemcani, O. & Ball, G. F. 1996. Do sex differences in the brain explain sex differences in the hormonal induction of reproductive behavior? What

- 25 years of research on the Japanese quail tells us. *Hormones and Behavior*, 30, 627-661.
- Bateman, A. J. 1948. Intrasexual selection in *Drosophila*. *Heredity*, 2, 349-368.
- Beilharz, R. G. 1960. The absence of sex-reversed males among progeny of oestrogen-treated pullets. *Poultry Science*, 39, 906-907.
- Bennett, A. T. D. & Cuthill, I. C. 1994. Ultraviolet vision in birds: what is its function? *Vision Research*, 34, 1471-1478.
- Bernardo, J. 1996. The particular maternal effect of propagule size, especially egg size: Patterns, models, quality of evidence and interpretations. *American Zoologist*, 36, 216-236.
- Beukeboom, L. W., de Jong, T. J. & Pen, I. 2001. Why girls want to be boys. *Bioessays*, 23, 477-480.
- Birkhead, T. R., Burke, T., Zann, R., Hunter, F. M. & Krupa, A. P. 1990. Extra-pair paternity and intraspecific brood parasitism in wild zebra finches *Taeniopygia guttata*, revealed by DNA fingerprinting. *Behavioral Ecology and Sociobiology*, 27, 315-324.
- Birkhead, T. R., Clarkson, K. & Zann, R. 1988. Extra-pair courtship, copulation and mate guarding in wild zebra finches *Taeniopygia guttata*. *Animal Behaviour*, 36, 1853-1855.
- Birkhead, T. R., Fletcher, F. & Pellatt, E. J. 1998. Sexual selection in the zebra finch *Taeniopygia guttata*: Condition, sex traits and immune capacity. *Behavioral Ecology and Sociobiology*, 44, 179-191.
- Birkhead, T. R., Fletcher, F. & Pellatt, E. J. 1999. Nestling diet, secondary sexual traits and fitness in the zebra finch. *Proceedings of the Royal Society of London. Series B: Biological Sciences*, 66, 385-390.
- Birkhead, T. R., Fletcher, F., Pellatt, E. J. & Staples, A. 1995. Ejaculate quality and the success of extra-pair copulation in the zebra finch. *Nature*, 377, 422-424.
- Birkhead, T. R., Schwabl, H. & Burke, T. 2000. Testosterone and maternal effects - integrating mechanisms and function. *Trends in Ecology & Evolution*, 15, 86-87.
- Blount, J. D., Metcalfe, N. B., Arnold, K. E., Surai, P. F., Devevey, G. L. & Monaghan, P. 2003. Neonatal nutrition, adult antioxidant defences and sexual attractiveness in the zebra finch. *Proceedings of the Royal Society of London. Series B: Biological Sciences*, 270, 1691-1696.
- Bradbury, R. B. & Blakey, J. K. 1998. Diet, maternal condition, and offspring sex ratio in the zebra finch, *Poephila guttata*. *Proceedings of the Royal Society of London. Series B: Biological Sciences*, 22, 895-899.
- Brant, J. W. A. & Nalbandov, A. V. 1956. Role of sex hormones in albumen secretion by the oviduct of chickens. *Poultry Science*, 52, 692-700.
- Brooks, R. 2000. Negative genetic correlation between male sexual attractiveness and survival. *Nature*, 406, 67-70.
- Bruggeman, V., Room, G., Vanmontfort, D., Verhoeven, G. & Decuyper, E. 2003. Effect of embryonic 19-nortestosterone treatment and surgical bursectomy on plasma concentrations of reproductive hormones, on inhibin content in adrenals and gonads and on the histological appearance of the gonads in the young chicken. *General and Comparative Endocrinology*, 131, 106-116.

PROXIMATE CONTROL OF AVIAN SEX ALLOCATION

- Bryk, A. S. & Raudenbush, S. W. 1993. *Hierarchical Linear Models: Application and Data Analysis Method*. Sage: Newbury Park.
- Burke, W. H. 1996. Effects of an in ovo injection of an anti-androgen on embryonic and post-hatching growth of broiler chicks. *Poultry Science*, 75, 648-655.
- Burley, N. T. 1980. Clutch overlap and clutch size - alternative and complementary reproductive tactics. *American Naturalist*, 115, 223-246.
- Burley, N. T. 1981. Sex ratio manipulation and selection for attractiveness. *Science*, 211, 721-722.
- Burley, N. T., Krantzberg, G. & Radman, P. 1982a. Influence of colour-banding on the conspecific preferences of zebra finches. *Animal Behaviour*, 27, 686-698.
- Burley, N. T. 1982b. Facultative sex-ratio manipulation. *American Naturalist*, 120, 81-107.
- Burley, N. T. 1985a. Leg-band color and mortality patterns in captive breeding populations of zebra finches. *Auk*, 102, 647-651.
- Burley, N. T. 1985b. The organization of behavior and the evolution of sexually selected traits. In: Gowaty, P. A. & Mock, D. W. (eds) *Avian monogamy*. Washington, D. C.: American Ornithologists' Union.
- Burley, N. T. 1986a. Comparison of the band-color preferences of 2 species of estrildid finches. *Animal Behaviour*, 34, 1732-1741.
- Burley, N. T. 1986b. Sexual selection for aesthetic traits in species with biparental care. *American Naturalist*, 127, 415-445.
- Burley, N. T. 1986c. Sex ratio manipulation in color-banded populations of zebra finches. *Evolution*, 40, 1191-1206.
- Burley, N. T. & Coopersmith, C. B. 1987. Bill color preferences of Zebra Finches. *Ethology*, 76, 133-151.
- Burley, N. T. 1988a. Wild zebra finches have band-colour preferences. *Animal Behaviour*, 36, 1235-1237.
- Burley, N. T. 1988b. The differential-allocation hypothesis: an experimental test. *The American Naturalist*, 132, 611-628.
- Burley, N. T. & Price, D. K. 1991. Extra-pair copulation and attractiveness in Zebra Finches. *Proceedings of the XX International Ornithological Congress*, 1367-1372.
- Burley, N. T., Price, D. K. & Zann, R. A. 1992. Bill color, reproduction and condition effects in wild and domesticated zebra finches. *Auk*, 109, 13-23.
- Burley, N. T. & Calkins, J. D. 1999. Sex ratios and sexual selection in socially monogamous zebra finches. *Behavioral Ecology*, 10, 626-635.

C

- Carere, C. 2003. *Personalities as epigenetic suites of traits. A study on a passerine bird*. Ph.D.thesis, University of Groningen, The Netherlands.
- Charnov, E. L. 1982. *The Theory of Sex Allocation*. Princeton, N.J.: Princeton University Press.
- Charnov, E. L., Losdenhartogh, R. L., Jones, W. T. & Vandenassem, J. 1981. Sex ratio evolution in a variable environment. *Nature*, 289, 27-33.
- Christians, J. K. & Williams, T. D. 1999. Effects of exogenous 17- β -estradiol on the reproductive physiology and reproductive performance of European starlings (*Sturnus vulgaris*). *Journal of Experimental Biology*, 202, 2679-2685.
- Clark, A. B. 1978. Sex ratio and local resource competition in a prosimian primate. *Science*, 201, 163-165.
- Clark, M. M. & Galef, B. G. 1995. Prenatal influences on reproductive life history strategies. *Trends in Ecology & Evolution*, 10, 151-153.
- Clark, M. M. & Galef, B. G. 1998. Perinatal influences on the reproductive behavior of adult rodents. In: Mousseau, T. A. & Fox, C. W. (eds) *Maternal Effects as Adaptations*. Oxford: Oxford University Press.
- Clotfelter, E. D. 1996. Mechanisms of facultative sex-ratio variation in zebra finches (*Taeniopygia guttata*). *Auk*, 113, 441-449.
- Clutton-Brock, T. H. 1986. Sex ratio variation in birds. *Ibis*, 128, 317-329.
- Clutton-Brock, T. H. 1988. Reproductive success. In: Clutton-Brock, T. H. (ed) *Reproductive Success* Chicago: The University of Chicago Press.
- Clutton-Brock, T. H. 1991. *The Evolution of Parental Care*. Princeton: Princeton University Press.
- Clutton-Brock, T. H., Albon, D. S. & Guinness, F. E. 1985. Parental investment and sex differences in juvenile mortality in birds and mammals. *Nature*, 313, 131-133.
- Cockburn, A., Legge, S. & Double, M. C. 2002. Sex ratios in birds and mammals: can the hypotheses be disentangled? In: Hardy, I. C. W. (ed) *Sex Ratios. Concepts and Research Methods*. Cambridge: Cambridge University Press.
- Collins, S. A., Hubbard, C. & Houtman, A. 1994. Female choice in the Zebra Finch - the effect of male beak colour and male song. *Behavioral Ecology and Sociobiology*, 35, 25-??
- Cordero, P. J., Griffith, S. C., Aparicio, J. M. & Parkin, D. T. 2000. Sexual dimorphism in house sparrow eggs. *Behavioral Ecology and Sociobiology*, 48, 353-357.
- Cordero, P. J., Vinuela, J., Aparicio, J. M. & Veiga, J. P. 2001. Seasonal variation in sex ratio and sexual egg dimorphism favouring daughters in first clutches of the spotless starling. *Journal of Evolutionary Biology*, 14, 829-834.
- Crews, D., Sakata, J. & Rhen, T. 1998. Developmental effects on intersexual and intrasexual variation in growth and reproduction in a lizard with temperature-dependent sex determination. *Comparative Biochemistry and Physiology C-Toxicology & Pharmacology*, 119, 229-241.
- Csada, R. D., James, P. C. & Espie, R. H. M. 1996. The 'file drawer problem' of non-significant results: Does it apply to biological research? *Oikos*, 76, 591-593.

PROXIMATE CONTROL OF AVIAN SEX ALLOCATION

- Cuthill, I. C., Hunt, S., Cleary, C. & Clark, C. 1997. Colour bands, dominance, and body mass regulation in male zebra finches (*Taeniopygia guttata*). *Proceedings of the Royal Society of London. Series B: Biological Sciences*, 264, 1093-1099.
- Cynx, J. & Nottebohm, F. 1992. Testosterone facilitates some conspecific song discriminations in castrated zebra finches (*Taeniopygia guttata*). *Proceedings of the National Academy of Sciences of the United States of America*, 89, 1376-1378.

D

- Daan, S., Dijkstra, C. & Weissing, F. J. 1996. An evolutionary explanation for seasonal trends in avian sex ratios. *Behavioral Ecology*, 7, 426-430.
- Darwin, C. 1859. *On the Origin of Species by Means of Natural Selection*. London: John Murray.
- Darwin, C. 1871. *The Descent of Man and Selection in Relation to Sex*. 1st edn. London: John Murray.
- Darwin, C. 1874. *The Descent of Man and Selection in Relation to Sex*. 2nd edn. London: John Murray.
- Dawson, A. 2000. Mechanisms of endocrine disruption with particular reference to occurrence in avian wildlife: a review. *Ecotoxicology*, 9, 59-69.
- de Kogel, C. H. 1997. Long-term effects of brood size manipulation on morphological development and sex-specific mortality offspring. *Journal of Animal Ecology*, 66, 168-178.
- Decuyper, E., Peczely, P., Muray, T., Balthazart, Y., Michels, H. & Kuhn, E. R. 1985. Long-term effect of incubation temperatures on production parameters and changes in luteinizing-hormone and gonadal-steroids during the onset of lay in the hen. *Poultry Science*, 64, 1785-1792.
- Dhondt, A. A. 1970. The sex ratio of great tit nestlings. *Bird Study*, 17, 282-286.
- Dijkstra, C., Daan, S. & Pen, I. 1998. Fledgling sex ratios in relation to brood size in size-dimorphic altricial birds. *Behavioral Ecology*, 9, 287-296.
- Dijkstra, C., Pen, I., Riedstra, B. & Daan, S. 2000. Experimentally induced sex-ratio variation in the zebra finch: interaction between paternal attractiveness and maternal experience. In: Pen, I. *Sex Allocation in a life history context*. Ph.D.thesis, University of Groningen, The Netherlands.
- Dijkstra, C., Daan, S. & Buker, J. B. 1990. Adaptive seasonal variation in the sex ratio of kestrel broods. *Functional Ecology*, 4, 143-147.
- Dingemans, N. J., Both, C., Drent, P. J. & Tinbergen, J.M. 2004. Fitness consequences of avian personalities in a fluctuating environment. *Proceedings of the Royal Society of London. Series B: Biological Sciences*, 271, 847-952.
- Droge, D. L., Gowaty, P. A. & Weathers, W. W. 1991. Sex-biased provisioning - a test for differences in field metabolic rates of nestling eastern bluebirds. *Condor*, 93, 793-798.
- Dunn, A. M. & Zann, R. A. 1996a. Undirected song encourages the breeding female zebra finch to remain in the nest. *Ethology*, 102, 540-548.
- Dunn, A. M. & Zann, R. A. 1996b. Undirected song in wild zebra finch flocks: Contexts and effects of mate removal. *Ethology*, 102, 529-539.

E

- Eising, C. M., Eikenaar, C., Schwabl, H. & Groothuis, T. G. G. 2001. Maternal androgens in black-headed gull (*Larus ridibundus*) eggs: consequences for chick development. *Proceedings of the Royal Society of London. Series B: Biological Sciences*, 268, 839-846.
- Eising, C. M. & Groothuis, T. G. G. 2003. Yolk androgens and begging behaviour in black-headed gull chicks: an experimental field study. *Animal Behaviour*, 66, 1027-1034.
- Eising, C. M., Müller, W., Dijkstra, C. & Groothuis, T. G. G. 2003. Maternal androgens in egg yolks: relation with sex, incubation time and embryonic growth. *General and Comparative Endocrinology*, 132, 241-247.
- El-Wailly, A. J. 1966. Energy requirements for egg-laying and incubation in the zebra finch, *Taeniopygia castanotis*. *Condor*, 68, 582-594.
- Elbrecht, A. & Smith, R. G. 1992. Aromatase enzyme activity and sex determination in chickens. *Science*, 255, 467-470.
- Ellegren, H., Gustafsson, L. & Sheldon, B. C. 1996. Sex ratio adjustment in relation to paternal attractiveness in a wild bird population. *Proceedings of the National Academy of Sciences of the United States of America*, 93, 11723-11728.
- Ellegren, H. & Sheldon, B. C. 1997. New tools for sex identification and the study of sex allocation in birds. *Trends in Ecology & Evolution*, 12, 255-259.
- Emlen, S. T. 1997. When mothers prefer daughters over sons. *Trends in Ecology & Evolution*, 12, 291-292.
- Eshel, I. & Sansone, E. 1991. Parent-offspring conflict over the sex-ratio in a diploid population with different investment in male and in female offspring. *American Naturalist*, 138, 954-972.
- Eshel, I. & Sansone, E. 1994. Parent-offspring conflict over sex-ratio. 2. Offspring response to parental manipulation. *American Naturalist*, 143, 987-1006.
- Ewen, J. G., Cassey, P. & Møller, A. P. 2004. Facultative primary sex ratio variation: a lack of evidence in birds? *Proceedings of the Royal Society of London. Series B: Biological Sciences*, 271, 1277-1282.

F

- Fawcett, T. W. 2003. *Multiple cues and variation in mate-choice behaviour*. Ph.D.thesis, University of Cambridge, UK.
- Ferguson, M. W. J. 1994. Temperature dependent sex determination and growth in reptiles and manipulation of poultry sex by incubation temperature. *Proceedings of the 9th European Poultry Conference in Glasgow*, 380-382.
- Finkler, M. S., Van Orman, J. B. & Sotherland, P. R. 1998. Experimental manipulation of egg quality in chickens: Influence of albumen and yolk on the size and body composition of near-term embryos in a precocial bird. *Journal of Comparative Physiology. B: Biochemical, Systemic, and Environmental Physiology*, 168, 17-24.

PROXIMATE CONTROL OF AVIAN SEX ALLOCATION

- Fisher, R. A. 1930. *The Genetical Theory of Natural Selection*. Oxford: Clarendon Press.
- Frank, S. A. 1990. Sex allocation theory for birds and mammals. *Annual Review of Ecology and Systematics*, 21, 13-55.
- Fraps, R. M., Sohn, H. A. & Olsen, M. W. 1956. Some effects of multiple pellet implants of diethylstilbestrol in 9 week old chickens. *Poultry Science*, 35, 665-668.

G

- Gil, D. 2003. Golden eggs: Maternal manipulation of offspring phenotype by egg androgen in birds. *Ardeola*, 50, 281-294.
- Gil, D., Graves, J., Hazon, N. & Wells, A. 1999. Male attractiveness and differential testosterone investment in zebra finch eggs. *Science*, 286, 126-128.
- Gilbert, A. B., Davidson, M. F., Hardie, M. A. & Wells, J. W. 1981. The Induction of atresia in the domestic fowl (*Gallus domesticus*) by Ovine LH. *General and Comparative Endocrinology*, 44, 344-349.
- Gilbert, A. B., Perry, M. M., Waddington, D. & Hardie, M. A. 1983. Role of atresia in establishing the follicular hierarchy in the ovary of the domestic hen (*Gallus domesticus*). *Journal of Reproduction and Fertility*, 69, 221-227.
- Godfray, H. C. J. & Werren, J. H. 1996. Recent developments in sex-ratio studies. *Trends in Ecology & Evolution*, 11, A59-A63.
- Godsave, S. F., Lohmann, R., Vloet, R. P. M. & Gahr, M. 2002. Androgen receptors in the embryonic zebra finch hindbrain suggest a function for maternal androgens in perihatching survival. *Journal of Comparative Neurology*, 453, 57-70.
- Goldstein, H. 1995. *Multilevel Statistical Models*. London: Edward Arnold.
- Griffiths, R. 1992. Sex-biased mortality in the lesser black-backed gull *Larus fuscus* during the nestling stage. *Ibis*, 134, 237-244.
- Griffiths, R., Daan, S. & Dijkstra, C. 1996. Sex identification in birds using two CHD genes. *Proceedings of the Royal Society of London. Series B: Biological Sciences*, 263, 1251-1256.
- Groothuis, T. & Meeuwissen, G. 1992. The influence of testosterone on the development and fixation of the form of displays in 2 age classes of young black-headed gulls. *Animal Behaviour*, 43, 189-208.
- Groothuis, T. G. G. & Schwabl, H. 2002. Determinants of within- and among-clutch variation in levels of maternal hormones in black-headed gull eggs. *Functional Ecology*, 16, 281-289.
- Gurney, M. E. 1982. Behavioral correlates of sexual differentiation in the zebra finch song system. *Brain Research*, 231, 153-172.
- Gustafsson, L., Qvarnstrom, A. & Sheldon, B. C. 1995. Trade-offs between life-history traits and a secondary sexual character in male collared flycatchers. *Nature*, 375, 311-313.

H

- Hackl, R., Bromundt, V., Daisley, J., Kotrschal, K. & Mostl, E. 2003. Distribution and origin of steroid hormones in the yolk of Japanese quail eggs (*Coturnix coturnix japonica*). *Journal of Comparative Physiology B: Biochemical Systemic and Environmental Physiology*, 173, 327-331.
- Hamilton, W. D. 1967. Extraordinary sex ratios. *Science*, 156, 457-488.
- Harding, C. F., Sheridan, K. & Walters, M. J. 1983. Hormonal specificity and activation of sexual-behavior in male zebra finches. *Hormones and Behavior*, 17, 111-133.
- Hardy, I. C. W. (ed.) 2002. *Sex Ratios. Concepts and Research Methods*. Cambridge: Cambridge University Press.
- Hasselquist, D. & Kempenaers, B. 2002. Parental care and adaptive brood sex ratio manipulation in birds. *Proceedings of the Royal Society of London. Series B: Biological Sciences*, 357, 363-372.
- Haywood, S. 1993. Sensory control of clutch size in the zebra finch (*Taeniopygia guttata*). *Auk*, 110, 778-786.
- Heinsohn, R., Legge, S. & Barry, S. 1997. Extreme bias in sex allocation in Eclectus parrots. *Proceedings of the Royal Society of London. Series B: Biological Sciences*, 264, 1325-1329.
- Henry, M. H. & Burke, W. H. 1999. The effects of in ovo administration of testosterone or an antiandrogen on growth of chick embryos and embryonic muscle characteristics. *Poultry Science*, 78, 1006-1013.
- Hessler, N. A. & Doupe, A. J. 1999. Social context modulates singing-related neural activity in the songbird forebrain. *Nature Neuroscience*, 2, 209-211.
- Hews, D. K., Knapp, R. & Moore, M. C. 1994. Early exposure to androgens affects adult expression of alternative male types in tree lizards. *Hormones and Behavior*, 28, 96-115.
- Hill, W. L. 1993. Importance of prenatal nutrition to the development of a precocial chick. *Developmental Psychobiology*, 26, 237-249.
- Houtman, A. M. 1992. Female zebra finches choose extra-pair copulations with genetically attractive males. *Proceedings of the Royal Society of London. Series B: Biological Sciences*, 249, 3-6.
- Howarth, B. 1971. An examination for sperm capacitation in the fowl. *Biology of Reproduction*, 3, 338-341.
- Hunt, S., Cuthill, I. C., Swaddle, J. P. & Bennett, A. T. D. 1997. Ultraviolet vision and band-colour preferences in female zebra finches, *Taeniopygia guttata*. *Animal Behaviour*, 54, 1383-1392.
- Hutchison, R. E., Hinde, R. A. & Steel, E. 1967. The effects of oestrogen, progesterone and prolactin on brood patch formation in ovariectomized canaries. *Journal of Endocrinology*, 39, 379-385.

PROXIMATE CONTROL OF AVIAN SEX ALLOCATION

I

- Immelmann, K. 1962a. Beiträge zu einer vergleichenden Biologie australischer Prachtfinken (*Spermestidae*). *Zoologische Jahrbücher Abteilung für Systematik, Ökologie und Geographie der Tiere*, 90, 1-196.
- Immelmann, K. 1962b. Vergleichende Beobachtungen über Verhalten domestizierter Zebrafinken in Europa und ihrer wilden Stammform in Australien. *Zeitschrift für Tierzüchtung und Züchtungsbiologie*, 77, 198-216.
- Immelmann, K. 1963. Tierische Jahresperiodik in ökologischer Sicht: ein Beitrag zum Zeitgeberproblem, unter besonderer Berücksichtigung der Brut- und Mauserzeiten australischer Vögel. *Zoologische Jahrbücher Abteilung für Systematik, Ökologie und Geographie der Tiere*, 19, 91-200.
- Immelmann, K., Hailman, J. P. & Baylis, J. R. 1982. Reputed band attractiveness and sex manipulation in zebra finches. *Science*, 215, 422

J

- James, W. H. 1985. Sex-ratio, dominance status and maternal hormone levels at the time of conception. *Journal of Theoretical Biology*, 114, 505-510.
- James, W. H. 1986. Hormonal-control of sex-ratio. *Journal of Theoretical Biology*, 118, 427-441.
- James, W. H. 1996. Evidence that mammalian sex ratios at birth are partially controlled by parental hormone levels at the time of conception. *Journal of Theoretical Biology*, 180, 271-286.
- Jarvis, E. D., Scharff, C., Grossman, M. R., Ramos, J. A. & Nottebohm, F. 1998. For whom the bird sings: Context-dependent gene expression. *Neuron*, 21, 775-788.
- Jennions, M. D., Møller, A. P. & Petrie, M. 2001. Sexually selected traits and adult survival: A meta-analysis. *Quarterly Review of Biology*, 76, 3-36.
- Jennions, M. D. 1998. The effect of leg band symmetry on female-male association in zebra finches. *Animal Behaviour*, 55, 61-67.
- Jones, R. E. 1971. The incubation patch of birds. *Biological Reviews*, 46, 315-339.
- Jurkevich, A. 2003. Vasotocin and reproductive functions of the domestic chicken. *Domestic Animal Endocrinology*, 25, 93-99.

K

- Kalmbach, E., Nager, R. G., Griffiths, R. & Furness, R. W. 2001. Increased reproductive effort results in male-biased offspring sex ratio: an experimental study in a species with reversed sexual size dimorphism. *Proceedings of the Royal Society of London. Series B: Biological Sciences*, 268, 2175-2179.
- Ketterson, E. D. & Nolan, V. 1999. Adaptation, exaptation and constraint: a hormonal perspective. *American Naturalist*, 154, 4-25.
- Kilner, R. 1998. Primary and secondary sex ratio manipulation by zebra finches. *Animal Behaviour*, 56, 155-164.

- Kirkpatrick, M. & Lande, R. 1989. The evolution of maternal characters. *Evolution*, 43, 485-503.
- Komdeur, J. 1996. Facultative sex ratio bias in the offspring of Seychelles warblers. *Proceedings of the Royal Society of London. Series B: Biological Sciences*, 263, 661-666.
- Komdeur, J., Daan, S., Tinbergen, J. & Mateman, C. 1997. Extreme adaptive modification in sex ratio of the Seychelles warbler's eggs. *Nature*, 385, 522-525.
- Komdeur, J., Magrath, M. J. & Krackow, S. 2002. Pre-ovulation control of hatchling sex ratio in the Seychelles warbler. *Proceedings of the Royal Society of London. Series B: Biological Sciences*, 269, 1067-1072.
- Komdeur, J. & Pen, I. 2002. Adaptive sex allocation in birds: the complexities of linking theory and practice. *Philosophical Transactions of the Royal Society of London. Series B: Biological Sciences*, 357, 373-380.
- Korsia, S. & Bottjer, S. W. 1991. Chronic testosterone treatment impairs vocal learning in male zebra finches during a restricted period of development. *Journal of Neuroscience*, 11, 2362-2371.
- Kozelka, A. W. & Gallagher, T. F. 1934. Effect of male hormone extracts, theelin and theelol, on the chick embryo. *Proceedings of the Society for Experimental Biology and Medicine*, 31, 1143-1144.
- Krackow, S. 2002. Why parental sex ratio manipulation is rare in higher vertebrates. *Ethology*, 108, 1041-1056.
- Krackow, S. 1995a. Potential mechanisms for sex ratio adjustment in mammals and birds. *Biological Reviews*, 70, 225-241.
- Krackow, S. 1995b. The developmental asynchrony hypothesis for sex ratio manipulation. *Journal of Theoretical Biology*, 176, 273-280.
- Krijgsveld, K. L., Dijkstra, C., Visser, G. H. & Daan, S. 1998. Energy requirements for growth in relation to sexual size dimorphism in marsh harrier *Circus aeruginosus* nestlings. *Physiological Zoology*, 71, 693-702.
- Kruijt, J. P. & Meeuwissen, G. B. 1993. Consolidation and modification of sexual preferences in adult male zebra finches. *Netherlands Journal of Zoology*, 43, 68-79.
- Kruijt, J. P., Tencate, C. J. & Meeuwissen, G. B. 1983. The influence of siblings on the development of sexual preferences of male zebra finches. *Developmental Psychobiology*, 16, 233-239.
- Lang, H. 1918. Hormonpräparate in der Fütterung von Alt- und Junggeflügel. *Archiv für Geflügelkunde*, 9, 22-25.

L

- Lank, D. B., Smith, C. M., Hanotte, O., Burke, T. & Cooke, F. 1995. Genetic polymorphism for alternative mating behaviour in lekking male ruff *Philomachus pugnax*. *Nature*, 378, 59-62.
- Lessells, C. M. 1998. A theoretical framework for sex-biased parental care. *Animal Behaviour*, 56, 395-407.

PROXIMATE CONTROL OF AVIAN SEX ALLOCATION

- Lessells, C. M. 2002. Parentally biased favouritism: why should parents specialize in caring for different offspring? *Philosophical Transactions of the Royal Society of London Series B: Biological Sciences*, 357, 381-403.
- Lessells, C. M., Oddie, K. R. & Mateman, A. C. 1998. Parental behaviour is unrelated to experimentally manipulated great tit brood sex ratio. *Animal Behaviour*, 56, 385-393.
- Lindström, J. 1999. Early development and fitness in birds and mammals. *Trends in Ecology & Evolution*, 14, 343-349.
- Lipar, J. L. & Ketterson, E. D. 2000. Maternally derived yolk testosterone enhances the development of the hatching muscle in the red-winged blackbird *Agelaius phoeniceus*. *Proceedings of the Royal Society of London. Series B: Biological Sciences*, 267, 2005-2010.
- Lipar, J. L., Ketterson, E. D., Nolan, V. & Casto, J. M. 1999. Egg yolk layers vary in the concentration of steroid hormones in two avian species. *General and Comparative Endocrinology*, 115, 220-227.
- Lipar, J. L. 2001. Yolk steroids and the development of the hatchling muscle in nestling European starlings. *Journal of Avian Biology*, 32, 231-238.
- Lowther, J. K. 1961. Polymorphism in the white-throated sparrow, *Zonotrichia albicollis*. *Canadian Journal of Zoology*, 39, 281-292.

M

- Magrath, M. J., van Lieshout, E., Visser, G. H. & Komdeur, J. 2004. Nutritional bias as a new mode of adjusting sex allocation. *Proceedings of the Royal Society of London. Series B: Biological Sciences*, 271 (Suppl.5), S347-S349.
- Magrath, M. J. L., Brouwer, L., van Petersen, A., Berg, M. L. & Komdeur, J. 2003. Breeding behaviour and ecology of the sexually size-dimorphic brown songlark, *Cinclorhamphus cruralis*. *Australian Journal of Zoology*, 51, 429-441.
- Mansukhani, V., Adkins-Regan, E. & Yang, S. 1996. Sexual partner preference in female zebra finches: The role of early hormones and social environment. *Hormones and Behavior*, 30, 506-513.
- Martins, T. L. F. 2004. Sex-specific growth rates in zebra finch nestlings: a possible mechanism for sex ratio adjustment. *Behavioral Ecology*, 15, 174-180.
- Maynard Smith, J. 1982. *Evolution and the Theory of Games*. Cambridge: Cambridge University of Press.
- Mazuc, J., Bonneau, S., Chastel, O. & Sorci, G. 2003. Social environment affects female and egg testosterone levels in the house sparrow (*Passer domesticus*). *Ecology Letters*, 6, 1084-1090.
- McGraw, K. J. & Ardia, D. R. 2003. Carotenoids, immunocompetence, and the information content of sexual colors: An experimental test. *American Naturalist*, 162, 704-712.
- McGraw, K. J., Gregory, A. J., Parker, R. S. & Adkins-Regan, E. 2003. Diet, plasma carotenoids, and sexual coloration in the zebra finch (*Taeniopygia guttata*). *Auk*, 120, 400-410.

- McNabb, F. M. A. & Wilson, C. M. 1997. Thyroid hormone deposition in avian eggs and effects on embryonic development. *American Zoologist*, 37, 553-560.
- Mead, P. S., Morton, M. L. & Fish, B. E. 1987. Sexual dimorphism in egg size and implications regarding facultative manipulation of sex in mountain white-crowned sparrows. *Condor*, 89, 798-803.
- Merilä, J. & Svensson, E. 1997. Are fat reserves in migratory birds affected by condition in early life? *Journal of Avian Biology*, 28, 279-286.
- Metcalfe, N. B. & Monaghan, P. 2001. Compensation for a bad start: grow now, pay later? *Trends in Ecology & Evolution*, 16, 254-260.
- Millam, J. R., Craig-Veit, C. B., Quaglino, A. E., Erichsen, A. L., Famula, T. R. & Fry, D. M. 2001. Posthatch oral estrogen exposure impairs adult reproductive performance of zebra finch in a sex-specific manner. *Hormones and Behavior*, 40, 542-549.
- Monaghan, P., Metcalfe, N. B. & Houston, D. C. 1996. Male finches selectively pair with fecund females. *Proceedings of the Royal Society of London. Series B: Biological Sciences*, 263, 1183-1186.
- Moore, M. C. 1991. Application of organization-activation theory to alternative male reproductive strategies: a review. *Hormones and Behavior*, 25, 154-175.
- Morris, D. 1954. The reproductive behaviour of the zebra finch (*Poephila guttata*) with special reference to pseudofemale behaviour and displacement activities. *Behaviour*, 7, 1-31.
- Mousseau, T. A. & Fox, C. W. 1998. *Maternal Effects as Adaptations*. New York: Oxford University Press.
- Müller, W., Dijkstra, C. & Groothuis, T. G. G. 2003. Inter-sexual differences in T-cell-mediated immunity of black-headed gull chicks (*Larus ridibundus*) depend on the hatching order. *Behavioral Ecology and Sociobiology*, 55, 80-86.
- Müller, W., Eising, C. M., Dijkstra, C. & Groothuis, T. G. G. 2002. Sex differences in yolk hormones depend on maternal social status in Leghorn chickens (*Gallus gallus domesticus*). *Proceedings of the Royal Society of London. Series B: Biological Sciences*, 269, 2249-2255.
- Muramatsu, T., Hiramoto, K., Koshi, N., Okumura, J., Miyoshi, S. & Mitsumoto, T. 1990. Importance of albumen content in whole-body protein synthesis of the chicken embryo during incubation. *British Poultry Science*, 31, 101-106.

N

- Nager, R. G., Monaghan, P., Griffiths, R., Houston, D. C. & Dawson, R. 1999. Experimental demonstration that offspring sex ratio varies with maternal condition. *Proceedings of the National Academy of Sciences of the United States of America*, 96, 570-573.
- Nager, R. G., Monaghan, P., Houston, D. C. & Genovart, M. 2000. Parental condition, brood sex ratio and differential young survival: an experimental study in gulls (*Larus fuscus*). *Behavioral Ecology and Sociobiology*, 48, 452-457.

PROXIMATE CONTROL OF AVIAN SEX ALLOCATION

Nishiumi, I., Yamagishi, S., Maekawa, H. & Shimoda, C. 1996. Paternal expenditure is related to brood sex ratio in polygynous great reed warblers. *Behavioral Ecology and Sociobiology*, 39, 211-217.

O

- Oddie, K. R. 2000. Size matters: competition between male and female great tit offspring. *Journal of Animal Ecology*, 69, 903-912.
- Oetting, S., Pröve, E. & Bischof, H. J. 1995. Sexual imprinting as a two-stage process: Mechanisms of information storage and stabilization. *Animal Behaviour*, 50, 393-403.
- Ökland, F. 1936. Gelingt beim Huhn eine willkürliche Geschlechtsbestimmung durch Sexualhormone ? *Biologisches Zentralblatt*, 56, 147-150.
- Olszanska, B., Malewska, A. & Stepinska, U. 1996. Maturation and ovulation of Japanese quail oocytes under in vitro conditions. *British Poultry Science*, 37, 929-935.
- Ottinger, M. A. & Bakst, M. R. 1981. Peripheral androgen concentrations and testicular morphology in embryonic and young male Japanese quail. *General and Comparative Endocrinology*, 43, 170-177.
- Ottinger, M. A., Balthazart, J. & Soares, J. H. 1984. A brief review of hormonal and behavioral aspects of reproduction in the aging avian male. *Journal of Steroid Biochemistry and Molecular Biology*, 20, 1566-1566.

P

- Palmer, A. R. 2000. Quasi replication and the contract of error: lessons from sex ratios, heritabilities and fluctuating asymmetry. *Annual Review of Ecology and Systematics*, 31, 441-480.
- Parker, G. A. 1972. The origin and evolution of gamete dimorphism and the male-female phenomenon. *Journal of Theoretical Biology*, 36, 181-198.
- Pen, I. 2000. *Sex allocation in a life history context*. Ph.D.thesis, University of Groningen, the Netherlands.
- Pen, I. & Weissing, F. J. 2002. Optimal sex allocation: steps towards a mechanistic theory. In: Hardy, I. C. W. (ed) *Sex Ratios. Concepts and Research Methods*. Cambridge: Cambridge University Press.
- Pen, I. & Weissing, F. J. 2000. Sex-ratio optimization with helpers at the nest. *Proceedings of the Royal Society of London. Series B: Biological Sciences*, 267, 539-543.
- Pen, I., Weissing, F. J. & Daan, S. 1999. Seasonal sex ratio trend in the European kestrel: An evolutionarily stable strategy analysis. *American Naturalist*, 153, 384-397.
- Perry, M. M. 1988. A complete culture system for the chick embryo. *Nature*, 331, 70-72.

- Petrie, M., Schwabl, H., Brande-Lavridson, N. & Burke, T. 2001. Sex differences in avian yolk hormone levels. *Nature*, 412, 498-498.
- Pike, T. W. & Petrie, M. 2003. Potential mechanisms of avian sex manipulation. *Biological Reviews*, 78, 553-574.
- Pilz, K. M., Smith, H. G., Sandell, M. I. & Schwabl, H. 2003. Interfemale variation in egg yolk androgen allocation in the European starling: do high-quality females invest more? *Animal Behaviour*, 65, 841-850.
- Pincus, G. & Erickson, A. E. 1962. Sex modifications in hens eggs following immersion in diethylstilbestrol solutions. *Endocrinology*, 71, 24-&.
- Potti, J., Davila, J. A., Tella, J. L., Frias, O. & Villar, S. 2002. Gender and viability selection on morphology in fledgling pied flycatchers. *Molecular Ecology*, 11, 1317-1326.
- Price, D. K. & Burley, N. T. 1993. Constraints on the evolution of attractive traits: Genetic (co)variance of zebra finch bill colour. *Heredity*, 71, 405-412.
- Price, D. K. & Burley, N. T. 1994. Constraints on the evolution of attractive traits: Selection in male and female zebra finches. *American Naturalist*, 144, 908-934.
- Pröve, E. 1974. Der Einfluss von Kastration und Testosteronsubstitution auf das Sexualverhalten männlicher Zebrafinken (*Taeniopygia guttata castanotis*). *Journal für Ornithologie*, 115, 338-347.
- Pun, C. F. 1958. The sex ratio in the progeny of oestrogen-treated parents in the brown leghorn. *Poultry Science*, 37, 307-311.

R

- Radford, A. N. & Blakey, J. K. 2000. Intensity of nest defense is related to offspring sex ratio in the great tit *Parus major*. *Proceedings of the Royal Society of London. Series B: Biological Sciences*, 267, 535-538.
- Randerson, J. P. & Hurst, L. D. 2001a. A comparative test of a theory for the evolution of anisogamy. *Proceedings of the Royal Society of London. Series B: Biological Sciences*, 268, 879-884.
- Randerson, J. P. & Hurst, L. D. 2001b. The uncertain evolution of the sexes. *Trends in Ecology & Evolution*, 16, 571-579.
- Ratcliffe, L. M. & Boag, P. T. 1987. Effect of colour bands on male competition and sexual attractiveness in zebra finches. *Canadian Journal of Zoology*, 65, 333-338.
- Reiss, M. J. 1987. Evolutionary conflict over the control of offspring sex-ratio. *Journal of Theoretical Biology*, 125, 25-39.
- Rhen, T. & Crews, D. 2002. Variation in reproductive behaviour within a sex: neural systems and endocrine activation. *Journal of Neuroendocrinology*, 14, 517-531.
- Riddle, O. & Dunham, H. H. 1942. Transformation of males to intersexes by estrogen passed from blood of ring doves to their ovarian eggs. *Endocrinology*, 30, 959-968.
- Riedstra, B. 2003. *Development and social nature of feather pecking*. Ph.D.thesis, University of Groningen, The Netherlands.
- Rodbard, D. 1974. Statistical quality control and routine data processing for radioimmunoassays and immunoradiometric assays. *Clinical Chemistry*, 20, 1255-1270.
- Romanoff, A. L. 1960. *The avian embryo*. New York: Macmillan.

PROXIMATE CONTROL OF AVIAN SEX ALLOCATION

- Ros, A. F. H., Groothuis, T. G. G. & Apanius, V. 1997. The relation among gonadal steroids, immunocompetence, body mass, and behavior in young black-headed gulls (*Larus ridibundus*). *American Naturalist*, 150, 201-219.
- Røskaft, E. & Slagsvold, T. 1985. Differential mortality of male and female offspring in experimentally manipulated broods of the rook. *Journal of Animal Ecology*, 54, 261-266.
- Roulin, A., Ducret, B., Ravoussin, P. A. & Altwegg, R. 2003. Female colour polymorphism covaries with reproductive strategies in the tawny owl *Strix aluco*. *Journal of Avian Biology*, 34, 393-401.
- Royle, N. J., Surai, P. F. & Hartley, I. R. 2001. Maternally derived androgens and antioxidants in bird eggs: complementary but opposing effects? *Behavioral Ecology*, 12, 381-385.
- Runfeldt, S. & Wingfield, J. C. 1985. Experimentally prolonged sexual activity in female sparrows delays termination of reproductive activity in their untreated mates. *Animal Behaviour*, 33, 403-410.
- Rutkowska, J. & Cichón, M. 2002. Maternal investment during egg laying and offspring sex: an experimental study of zebra finches. *Animal Behaviour*, 64, 817-822.
- Rutstein, A. 2004. Diet quality and resource allocation in the zebra finch. *Proceedings of the Royal Society of London. Series B: Biological Sciences*, (Suppl.) 271, 286-289

S

- Saino, N., Romano, M., Ferrari, R. P., Martinelli, R. & Møller, A. P. 2003. Maternal antibodies but not carotenoids in barn swallow eggs covary with embryo sex. *Journal of Evolutionary Biology*, 16, 516-522.
- Sayag, N., Snapir, N., Robinzon, B. & Grimm, V. E. 1988. Effect of embryonic treatment with estradiol benzoate on the aggressive behaviour of cockerels. *International Journal of Neuroscience*, 41, 265-270.
- Schouppé, K. 1930. Beitrag zur hormonalen Beeinflussung des Geschlechts. *Archiv für wissenschaftliche und praktische Thierheilkunde*, 62, 267-270.
- Schumacher, M., Hendrick, J. C. & Balthazart, J. 1989. Sexual-differentiation in quail - critical period and hormonal specificity. *Hormones and Behavior*, 23, 130-149.
- Schwabl, H. 1993. Yolk is source of maternal testosterone for developing birds. *Proceedings of the National Academy of Sciences of the United States of America*, 90, 11446-11450.
- Schwabl, H. 1996a. Maternal testosterone in the avian egg enhances postnatal growth. *Comparative Biochemistry and Physiology*, 114A, 271-276.
- Schwabl, H. 1996b. Environment modifies the testosterone levels of a female bird and its eggs. *Journal of Experimental Zoology*, 276, 157-163.
- Schwabl, H. 1997. The contents of maternal testosterone in house sparrow *Passer domesticus* eggs vary with breeding conditions. *Naturwissenschaften*, 84, 406-408.
- Schwabl, H. 1998. Mother knows best. *Natural History*, 107, 24-25.

- Schwabl, H., Mock, D. W. & Gieg, J. A. 1997. A hormonal mechanism for parental favouritism. *Nature*, 386, 231-231.
- Seger, J. & Stubblefield, J. W. 2002. Models of sex ratio evolution. In: Hardy, I. C. W. (ed) *Sex Ratios. Concepts and Research Methods*. Cambridge: Cambridge University Press.
- Sheldon, B. C. 1998. Recent studies of avian sex ratios. *Heredity*, 80, 397-402.
- Sheldon, B. C., Andersson, S., Griffith, S. C., Ornborg, J. & Sendecka, J. 1999. Ultraviolet colour variation influences blue tit sex ratios. *Nature*, 402, 874-877.
- Sockman, K. W. & Schwabl, H. 2000. Yolk androgens reduce offspring survival. *Proceedings of the Royal Society of London. Series B: Biological Sciences*, 267, 1451-1456.
- Sockman, K. W., Schwabl, H. & Sharp, P. J. 2001. Regulation of yolk-androgen concentrations by plasma prolactin in the American kestrel. *Hormones and Behavior*, 40, 462-471.
- Sossinka, R. 1980. Ovarian development in an opportunistic breeder, the zebra finch *Poephila guttata*. *Journal of Experimental Zoology*, 211, 225-230.
- Spicer, A. 1954. *British Veterinary Journal*, 110, 358-359.
- Stamps, J., Clark, A., Kus, B. & Arrowood, P. 1987. The effects of parent and offspring gender on food allocation in budgerigars. *Behaviour*, 101, 177-199.
- Stamps, J. A. 1990. When should avian parents differentially provision sons and daughters. *American Naturalist*, 135, 671-685.
- Steel, E. & Hinde, R. A. 1972. Influence of photoperiod on oestrogenic induction of nest building in canaries. *Journal of Endocrinology*, 55, 265-278.
- Sturkie, P. D. 1986. *Avian Physiology*. Berlin: Springer.
- Swaddle, J. P. & Cuthill, I. C. 1994a. Female zebra finches prefer males with symmetrical chest plumage. *Proceedings of the Royal Society of London. Series B: Biological Sciences*, 258, 267-271.
- Swaddle, J. P. & Cuthill, I. C. 1994b. Preference for symmetrical males by female zebra finches. *Nature*, 367, 165-166.

T

- Taber, E. 1964. Intersexuality in birds. In: Armstrong, C. N. & Marshall, A. J. (eds) *Intersexuality in Vertebrates Including Man* London: Academic Press.
- Taylor, R. L. & Glick, B. 1983. Pituitary and testicular activity in chickens after embryonic testosterone treatment. *American Journal of Physiology*, 244, E66-E71.
- Tchernichovski, O. & Nottebohm, F. 1998. Social inhibition of song imitation among sibling male zebra finches. *Proceedings of the National Academy of Sciences of the United States of America*, 95, 8951-8956.
- Teather, K. L. 1992. An experimental study on competition for feed between male and female nestlings of the red-winged blackbird. *Behavioral Ecology and Sociobiology*, 31, 81-87.

PROXIMATE CONTROL OF AVIAN SEX ALLOCATION

- Teather, K. L. & Weatherhead, P. J. 1988. Sex-specific energy requirements of great-tailed grackle (*Quiscalus mexicanus*) nestlings. *Journal of Animal Ecology*, 57, 659-668.
- ten Cate, C. J. & Mug, G. 1984. The development of mate choice in Zebra Finches. *Behaviour*, 90, 125-150.
- Thissen, D. & Martin, E. 1982. Reputed band attractiveness and sex manipulation in Zebra Finches. *Science*, 215, 423
- Torres, R. & Drummond, H. 1997. Female-biased mortality in nestlings of a bird with size dimorphism. *Journal of Animal Ecology*, 66, 859-865.
- Trivers, R. L. 1974. Parent-offspring conflict. *American Zoologist*, 14, 249-264.
- Trivers, R. L. & Hare, H. 1975. Haplodiploidy and evolution of social insects. *Science*, 191, 249-263.
- Trivers, R. L. & Willard, D. E. 1973. Natural selection of parental ability to vary the sex ratio of offspring. *Science*, 179, 90-92.
- Tsang, C. P. W. & Grunder, A. A. 1984. Production, clearance rates and metabolic fate of estradiol-17^β in the plasma of the laying hen. *Steroids*, 43, 71-85.

V

- Veiga, J. P., Vinuela, J., Cordero, P. J., Aparicio, J. M. & Polo, V. 2004. Experimentally increased testosterone affects social rank and primary sex ratio in the spotless starling. *Hormones and Behavior*, 46, 47-53.
- Verboven, N., Monaghan, P., Evans, D. M., Schwabl, H., Evans, N., Whitelaw, C. & Nager, R. G. 2003. Maternal condition, yolk androgens and offspring performance: a supplemental feeding experiment in the lesser black-backed gull (*Larus fuscus*). *Proceedings of the Royal Society of London. Series B: Biological Sciences*, 270, 2223-2232.
- Vining, R. F. 1980. Testosterone radioimmunoassay: rapid extraction technique for steroids based on kieselguhr mini-columns. *Steroids*, 36, 149-159.
- vom Saal, F. S. 1983. Models of early hormone effects on intrasex aggression in mice. In: Svare, B. B. (ed) *Hormones and Aggressive Behavior*. New York: Plenum Press.

W

- Wade, J., Buhlman, L. & Swender, D. 2002. Post-hatching hormonal modulation of a sexually dimorphic neuromuscular system controlling song in zebra finches. *Brain Research*, 929, 191-201.
- Wade, J. & Arnold, A. P. 1996. Functional testicular tissue does not masculinize development of the zebra finch song system. *Proceedings of the National Academy of Sciences of the United States of America*, 93, 5264-5268.
- Wade, J., Gong, A. & Arnold, A. P. 1997. Effects of embryonic estrogen on differentiation of the gonads and secondary sexual characteristics of male zebra finches. *Journal of Experimental Zoology*, 278, 405-411.

- Walsh, J. P., Metzger, D. A. & Higuchi, R. 1991. Chelex-100 as a medium for simple extraction of DNA for PCR-based typing from forensic material. *Biotechniques*, 10, 506-513.
- Walters, M. J., Collado, D. & Harding, C. F. 1991. Estrogenic modulation of singing in male zebra finches - differential-effects on directed and undirected songs. *Animal Behaviour*, 42, 445-452.
- Ward, B. C., Nordeen, E. J. & Nordeen, K. W. 2001. Anatomical and ontogenetic factors producing variation in HVC neuron number in zebra finches. *Brain Research*, 904, 318-326.
- Weatherhead, P. J. & Robertson, R. J. 1979. Offspring quality and the polygyny threshold: 'The sexy son hypothesis'. *American Naturalist*, 113, 201-208.
- Weathers, W. W., Hodum, P. J. & Anderson, D. J. 1997. Is the energy cost of begging by nestling passerines surprisingly low? *Auk*, 114, 133
- West, S. A., Lively, C. M. & Read, A. F. 1999. A pluralist approach to sex and recombination. *Journal of Evolutionary Biology*, 12, 1003-1012.
- West, S. A., Reece, S. E. & Sheldon, B. C. 2002. Sex ratios. *Heredity*, 88, 117-124.
- West-Eberhard, M. J. 2003. *Developmental Plasticity and Evolution*. Oxford: Oxford University Press.
- Whittingham, L. A. & Dunn, P. O. 2002. Offspring sex ratios in tree swallows; females in better condition produce more sons. *Molecular Ecology*, 9, 1123-1129.
- Whittingham, L. A. & Schwabl, H. 2002. Maternal testosterone in tree swallow eggs varies with female aggression. *Animal Behaviour*, 63, 63-67.
- Williams, G. C. 1979. The question of adaptive sex ratio in outcrossed vertebrates. *Proceedings of the Royal Society of London. Series B: Biological Sciences*, 205, 567-580.
- Williams, T. D. & Miller, M. 2003. Individual and resource-dependent variation in ability to lay supranormal clutches in response to egg removal. *Auk*, 120, 481-489.
- Williams, T. D. 1999. Parental and first generation effects of exogenous 17- β -estradiol on reproductive performance of female zebra finches (*Taeniopygia guttata*). *Hormones and Behavior*, 35, 135-143.
- Wilson, J. A. & Glick, B. 1970. Ontogeny of mating behavior in the chicken. *American Journal of Physiology*, 218, 951-955.
- Wingfield, J. C. 1994. Behavioral and hormonal responses of male song sparrows to estradiol-treated females during the non-breeding season. *Hormones and Behavior*, 28, 146-154.
- Wingfield, J. C. & Farner, D. S. 1975. The determination of five steroids in avian plasma by radioimmunoassay and competitive protein binding. *Steroids*, 26, 311-327.
- Winkler, D. W. 1993. Testosterone in egg-yolks - an ornithologists perspective. *Proceedings of the National Academy of Sciences of the United States of America*, 90, 11439-11441.
- Wolff, E. & Wolff, E. 1951. The effects of castration on bird embryos. *Journal of Experimental Zoology*, 116, 59-97.
- Woods, J. E. & Brazzill, D. M. 1981. Plasma 17- β -estradiol levels in the chick-embryo. *General and Comparative Endocrinology*, 44, 37-43.

PROXIMATE CONTROL OF AVIAN SEX ALLOCATION

- Woods, J. E., Simpson, R. M. & Moore, P. L. 1975. Plasma testosterone levels in chick-embryo. *General and Comparative Endocrinology*, 27, 543-547.
- Wynn, S. E. & Price, T. 1993. Male and female choice in zebra finches. *Auk*, 110, 635-638.

Z

- Zann, R. 1994. Effects of band color on survivorship, body condition and reproductive effort of free-living Australian zebra finches. *Auk*, 111, 131-142.
- Zann, R. & Runciman, D. 2003. Primary sex ratios in zebra finches: no evidence for adaptive manipulations in wild and semi-domesticated populations. *Behavioral Ecology and Sociobiology*, 54, 294-302.
- Zann, R. A. & Rossetto, M. 1991. Zebra finch incubation: brood patch, egg temperature and thermal properties of the nest. *Emu*, 91, 107-120.
- Zann, R. A. 1996. *The Zebra Finch. A Synthesis of Field and Laboratory Studies*. Oxford: Oxford University Press.