$G_{\mathcal{A}}$ for \mathcal{A} , and \mathcal{A} and \mathcal{A} and \mathcal{A} and \mathcal{A} and \mathcal{A} and \mathcal{A} $\mathbf{r}^{\mathbf{A}}$ in Savannah space $\mathbf{r}^{\mathbf{A}}$ i (Passerculus sandwichensis)

Corey R. Freeman-Gallant,

choice of mates, although certain types of close inbreed ing are especially avoided (Mauch α and α Mauck 1998; where ζ is a control 2006). The importance of subtle $r_{\rm in}-1$ is $r_{\rm in}$ (generate). cestuous) levels of inbreeding to female mating patterns has not been thoroughly explored (Freeman-Gallant et al. 2003).

MATERIALS AND METHODS

 $W^{\mu\nu}$ studies of the choice in a population of Savannah space in a population of Savannah space \mathcal{S} breeding at the Bowdoin Scientific Station on Kent Island, New Brunswick, Canada from 1994–1995 and from 2002– 2003 as part of a longer term (1987–2004) study. Savannah study. Savannah (1987) 2004 sparrows are migratory passerines found in grassland habitats across North America (Wheelwright and Rising 1993). On Kent Island, they show high natal and breeding philopatry \mathcal{A} (where $\mathcal{F} = \mathcal{F} = \mathcal{F} = 1998$). In any 1 year, as many as many as 53–79% of adults are of known age and social pedigrees ex tend an average of 3 generations. All adults in our study area were individually marked with a random combination of 3 colored leg bands and a United States Fish and Wildlife Service aluminum bandinum bandinum banding, we measured banding, we measured banding, we measured banding, $A = \{1, \ldots, n\}$ the wing length $\theta_{\rm s}$ (to $\theta_{\rm s}$ and $\theta_{\rm s}$, $\theta_{\rm s}$) and $\theta_{\rm s}$ (to neare the mass (to neare 0.1 g) of each adult and obtained a small sample of blood and obtained a small sample of blood α $(50,75~\mu)$ from the brachial vein. We identified social pairs of μ

 $\gamma_{\rm eff}$ the 4 years of the study, we observe 175 males and σ 206 females. Mating fields was known for k of the feed f these feedbacks k males (69.9%). In total, 60 of these observations derive from the from $f_{\rm{in}}$ 30 females who were present in consecutive γ females (1994 and γ 1995 or 2002 and 2003). In all $\frac{1}{2}$ 30.1 is a set of the second females of $\frac{1}{2}$ paired with different males. Nonetheless, we tested whether this pseudoreplication affected the results by randomly choos ing only a single set of observations for each of the 30 re peated females. Because analyses with and without these exclusions were qualitatively and α and α and α and α the results from the full data set are presented below. Analyses were performed using $\mathcal{E}_{\mathbf{z}}$ and $\mathcal{E}_{\mathbf{z}}$ are performed using $\mathcal{E}_{\mathbf{z}}$ $J_{\rm eff}$ JMP version \sim 12 for the Macintosh. Residuals were normalized were not the Macintosh. Residuals were not ∂t and approximately homoscenastic through ∂t use of parameters of parameters. All P values are 2 tailed.

RESULTS

Social mates

There is no evidence to suggest that females avoided pairing avoided pairing avoided pairing avoided pairing a with generically similar males. Mean similar males. Mean similar materials $\mathcal{M}_{\mathbf{q}}$ mates reflective the overall distribution of similar section of similar sections of similar sections of simila obtained by pairing each female to all males present in the $p \mapsto \{r \mid r, r \in \mathbb{R}^n : r \in \math$

in a set of condition on $\mathcal{S}(p,q)$ is the $t=-1.87$, ± 48 , $P = 0.068$) that with $r = \frac{1}{2}r$ of the same nest, $r = \frac{1}{2}r$ is the same nest, $r = \frac{1}{2}r$ although nestling wing length was unaffected by parentage by parentage by parentage η $(P_a \geq 0.25)$. Because male nestlings were heavier and in better P_a order $_{\mathbb{R}}$ than females 8 than female nestlings (2-way $\mathrm{A}=\mathrm{A}$ order co trolling for $F_{1,383} > 30.5, P \leq 0.002$), it is possible that EPP effects were mediated by original generation A or A $E_{\rm{eff}}$ showed a greater (though nonsignificant) tendency to the σ **be male in 2003 (56.9% of 65 EPY Were male compared with the set of 122** WP_Y; v₂ = 3.09, P = 0.08), EPY were not disproportionately male in 2002 (42.1% of 121 EPY were male computed with 40.0% of 95 WPY; $\chi^2 = 0.10$, $P = 0.75$). Moreover, etc. pooling over nests, EPY were in better condition at fledging \mathbf{r} regardless of general WPY regardless of \mathbf{r} 2002 (2-way ANOVA reference for general for $f_{1,196} = 5.59$, $P = 0.019$, Figure 2). In 2003 , these differences in condition were not statistically condition were not statistically conditions. $\mathcal{L}_{\mathcal{B}}$ is $\mathcal{E}_{1,176}$ and $\mathcal{E}_{2,16}$ and $\mathcal{E}_{2,16}$ controlled for $\mathcal{E}_{2,176}$ is equal for $\mathcal{E}_{3,176}$ and $\mathcal{E}_{4,176}$ and $\mathcal{E}_{5,176}$ and $\mathcal{E}_{6,176}$ and $\mathcal{E}_{7,176}$ and $\mathcal{E}_{8,176}$ $2.57, P_0 = 0.11, \quad (2).$ Parental similarity did not predict the condition, mass, or size of daughters in either year (Table 3). However, in 2003, the mass of sons declined significantly with increasing parents $\mathcal{P}_\mathbf{z}$ tal similarity. Sons produced by the most genetically similar similar similar similar similar similar similar adults fledged 2.2 g lighter on average that sons produced by α the least similar adults. Wing length on day 8 also appeared to decline with the increasing genetic similarity of parents in 2003 (masses 3). There was no effect of particle particle similar s $\mathbf{r} = \begin{bmatrix} r_{\star} & \ldots & r_{\star} & \mathbf{v}_{\star} \end{bmatrix}$ in 2002.

DISCUSSION Based on traditional models of good-genes sexual selection, female birds are predicted to cuckold poor quality social mates in preference for males that are of intrinsically higher that are of interior \mathcal{N} intrinsically higher that are of intrinsically higher that are of interior \mathcal{N} genetic quality (Birkhead and Møller 1998). Good-genes sex ual selection by females can also take the form of complemen- α tary choice where the ultimate goal is to produce of α is to produce of α with a more advantageous (or less intervals incompatible) combination \mathcal{P} of maternal and paternal haplotypes (Brown 1997; Tregenza and 2000 ; neft and P and 2005). We found that female Savannah sparrows are more likely to produce EPY when \mathcal{P}_c is a standard to generate the generation of the females but that females but that females but that females but that females \mathcal{P}_c decisions about mating fidelity are largely insensitive to abso lute measures of male quality, including the size, male \mathcal{N} age of their social mates. Observations of increased heterozy gosity among EPY $\rho_{\rm eff}$, and another presence of disassortation of disassorta-of disassorta-of disassorta- $.2003)$ study provides direct evidence that genome-wide levels of sim ilarity can predict female mating fidelity. Similar results have \mathcal{E} been previously described in shorebirds (Blomqvist et al. 2002; Thuman and (2005) , where (1000) spread, and in other passerines where females risk fertiliza tions from close kine kin (Eine kin et al. 2005). Our earlier work with Savannah sparrows revealed disassor tative matrix matrix \bullet is the spectrum similar similar to MHC observations may indicate that females assess their genetic similarity to the their social material material material material material \mathbf{r}_i are similar, but then mate at random with respect to their genetic similarity to local males. Because the relative abundance of less similar males depends strongly on the extent of genetic similarity between females and the social material materi $(\square_{\mathcal{F}} \rightarrow 3),$ such a strategy should result in fertilizations from $r_{\mathcal{F}}$ more compatible (less similar) males as long as similar social mates are reliably identified and cuckolded. EPP appears to be advantageous for females producing EPY. EPY fledged heavier and tended to be in better condition than WPY in the same brood, indicating that they probably also had higher survivorship (NT Wheelwright and CR Freeman- Gallant, unpublished data). In part, this result may be attrib uted to the underlying importance of parental similarity to offspring quality. The fledging mass of sons (but not daugh-

 u^2 unable to avoid genetically similar birds with whom they have the with whom they have the α no social experimental experiment α birds relations β in even the β own sons when choosing social mates and seeking extrapair copulations (Wheelwright et al. 2006). These results may subgest that the decision to produce EPY depends on a different \mathbf{g} and \mathbf{g} introduced \mathbf{g} . The A. 2002. Extra pair paterns in \mathbf{g} birds: a review of interspecific variation and adaptive function. \cdots 11:2195–212. Hansson B, Britist D, Hansson A_i er Britist D, Microsatellite, Microsatellit diversity predicts recruitment of sibling great reed warblers. Proc R \cdots \cdots \cdots \cdots 268:1287–91. Hasselquist D, Bensch S, von Schantz T. 1996. Correlation between male song repertoire, extra-pair paternity, and offspring survival in the great reed warehouse $381:229-32.$ Hochachka W, Smith JNM. 1991. Determinants and consequences of nestling condition in song sparrows. J Anim Ecol 60:995–1008. Jennifer \mathcal{A}_{max} , M. \mathcal{A}_{max} and \mathcal{A}_{max} and \mathcal{A}_{max} and \mathcal{A}_{max} and \mathcal{A}_{max} of the generation of \sim 75:21–64. \mathcal{L}_M (see Fig.). The statistical intervals in the specific introduction \mathcal{L}_M size differences in the avian CHD gene provide an efficient method ζ sex identification in birds. Auk 115:1074–8. Keller L, Arcese P, Smith J, Smith J, Smith J, Sterns SC. 1994.