**Appendix 1:** Overview of studies linking cognitive performance and reproductive success in wild animal populations. Studies are classified by taxon. For each cognitive task, we provide details about whether the study took place in a field laboratory or directly in the field. Reproductive success metrics are provided. The relationship between cognitive performance and reproductive success is either positive (+), negative (-) or non-significant (NS).

|  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| **Species** | **Context** | **Cognitive traits** | **Cognitive task** | | **Reproductive success metric** | **Statistics** | **Intrinsic characteristics** | **Sample size** | **Results** | **References** |
|  |  |  |  | |  |  |  |  |  |  |
| Great tit (*Parus major*) | Wild tested in field lab | Problem solving | | Lever pulling food acquisition | Clutch size | GLMM for Poisson data | Sex  Age | N = 676  308 ♂  368 ♀ | **+** in ♀  NS in ♂ | (Cole et al., 2012) |
| Nestling  survival | GLMM for binomial data | N = 676  308 ♂  368 ♀ | - in ♀  NS in ♂ |
| Fledgling  number | GLMM for Poisson data | N = 580  273 ♂  307 ♀ | **+** in ♀  NS in ♂ |
| Great tit (*Parus major*) | Wild | Problem solving | String pulling obstacle removal | | Clutch size  Fledgling  number  Nestling  survival | GLM for binomial data | Sex  Body condition | N = 26 pairs | **+** fledgling number  + clutch size  NS Nestling  Survival | (Cauchard et al., 2013) |
| Great tit (*Parus major*) | Wild | Problem solving | String pulling obstacle removal | | Fledgling  number | LM for binomial data | Sex  Body condition | N = 150 pairs | **+** fledgling numberin year 1 | (Cauchard et al., 2017) |
| Great tit (*Parus major*) | Wild | Problem solving | Obstacle removal  Food acquisition | | Clutch size, Hatching  success,  Fledgling  Number | LMM for quasi-binomial data | Sex  Personality  Age | N = 55 pairs | Obstacle removal:  NS clutch size  + hatching success  + fledgling number  Food acquisition task  NS clutch size,  hatching success,  fledgling number | (Preiszner et al., 2017) |
| House sparrow  *(Passer domesticus)* | Wild | Problem  solving | Obstacle removal | | Nestling  Survival  Nestling  size | GLM for binomial data | Sex  Age | N = 80  41 ♂  39 ♀ | Nestling  survival  NS in ♀  + in ♂  Nestling size  NS in ♀ and ♂ | (Wetzel, 2017) |
| Satin bower  Bird (*Ptilonorhynchus*  *violaceus*) | Wild | Problem  solving | Obstacle removal  Coverage task | | Mating  success | Regression analyses | Age  Motivation | Obstacle removal: N = 25 ♂  Coverage task:  N = 33 ♂ | + for both tasks | (Keagy et al., 2009) |
| Satin bower  Bird (*Ptilonorhynchus*  *violaceus*) | Wild | ‘Intelligence score’  from 6 tasks  and each task separately | Problem-solving (x 2)  Mimetic repertoire  Bower rebuilding (x 3) | | Mating  success | Regression analyses |  | 21 ♂ | NS Problem solving (task 1)  - Problem solving (task 2)  + Mimetic repertoire  + Bower rebuilding (tasks 4 and 5)  NS Bower rebuilding (task 6) | (Keagy et al., 2011) |
| Spotted bower  Bird (*Ptilonorhynchus*  *maculatus*) | Wild | PCA score  from 6 tasks | Motor task, Colour and  shape  discrimination, 3.reversal learning,  4.spatial memory | | Mating  success | Spearman rank correlation  &  LMM with PCA score | Age | 11 ♂ | NS for all tasks | (Isden et al., 2013) |
| Australian  Magpie (*Cracticus*  *tibicen dorsalis*) | Wild | PCA score  from 4 tasks | Inhibitory  control Associative  learning Reversal  learning  Spatial  memory | | Number of  clutches and  fledglings  per year Fledgling  survival | GLMM with PCA score | Body mass | 22 ♀ | + for all tasks | (Ashton et al., 2018) |
| New Zealand robin (*Petroica*  *longipes*) | Wild | Spatial memory | Food acquisition | | Number of fledglings  Hatching success  Fledgling  survival | GLM & GLMM for Poisson data | Sex  Age  Body condition | N = 49  31 ♂  18 ♀ | ♂  + Number of fledglings  NS Hatching success  + Fledgling  survival  ♀  NS Number of  fledglings, hatching success fledgling  survival | (Shaw et al., 2019) |
| Black-capped chickadee (*Poecile gambeli*) | Wild | Spatial learning and memory | Spatial array | | Clutch size  Brood size | GLM | Sex  Age | 27 ♂  14 ♀ | ♂  + Clutch size  + Nrood size  ♀  NS Clutch size, brood size | (Branch et al., 2019) |