

1. Algebraic description:

$$Y_i \sim \text{Poisson}(\lambda_i)$$

$$\text{Log}(\lambda_i) = \beta_0 + \beta_1 * x_i$$

My data looks at fishing landings in southwestern Madagascar. I'm concerned with the differences in catch between men and women in terms of where they got it, how much they're bringing in, etc. This is a Poisson t test where I am trying to see if the number of cephalopods caught per trip (Y_i) is different among male vs female fishers. We assume the number of cephalopods is a Poisson distribution where λ_i gives the mean and variance of that distribution. Here, β_0 represents the expected number of cephalopods caught by women β_1 represents the difference between that and the expected number of cephalopods caught by male fishers. x_i represents the sex of the fisher with 0 representing women and 1 representing men.

2. JAGS CODE:

```
sink("cephs_sno.txt")
cat("
  model {

    # PRIORS
    beta0 ~ dnorm(0,0.001) # intercept
    beta1 ~ dnorm(0,0.001) # effect of M/F, IDK

    # LIKELIHOOD
    for(i in 1:n){
      cephs[i] ~ dpois(lambda[i]) #error term built in bc lambda is
both mean and var
      log(lambda[i]) <- beta0 + beta1 * sex[i] # sex needs to be 0s
and 1s. predicting log of lambda, not lambda
      #lambda[i] <- exp(beta0 + beta1 * sex[i] ) Alternative form
    } # i

  } # end of model
",fill = TRUE)
sink()
```

Note: I want to eventually add a Bayesian p value and possibly combine it with a larger more complicated model, I just can't get this one to run quite right

3. Unexpected observations or challenges:

I keep getting the following error:

```
Error in jags.model(model.file, data = data, inits = init.values,  
n.chains = n.chains,  :
```

LOGIC ERROR:

Invalid shape in LGMix::updateShape

Please send a bug report to martyn_plummer@users.sourceforge.net

From my understanding from googling this error, something is actually wrong with the data, but I haven't been able to figure out what yet. Below I've pasted a boxplot of what the data looks like if that's helpful (ignore the "site" label). There are about ten times the number of datapoints for men vs women, I'm not sure if that matters but the difference in variance may have something to do with that.

