Female hurricanes are not deadlier than male hurricanes

Jung, Shavitt, Viswanathan, and Hilbe (1) report that "severe hurricanes with female names are associated with significantly higher death rates" than severe hurricanes with male names. Their finding is the result of using a misspecified statistical model: an alternative specification which gives a better fit to the data shows no evidence that the gender of hurricane names affects the number of deaths, either on its own or in interaction with severity. The alternative specification simply uses the logarithm of normalized damage as a predictor rather than the dollar value of normalized damage.

Table 1 shows statistics on the fit of several negative binomial regression models. Models 1 and 2 were fitted by Jung et al. Model 1 includes minimum pressure, normalized damage, and the masculinity-femininity index (MFI) of the hurricane name. Model 2 adds interactions of MFI with minimum pressure and normalized damage; this is the model on which Jung et al. base their conclusions. Model 1a is identical to Model 1 except that it includes the logarithm of normalized damage rather than normalized damage. Model 2a is identical to model 2 except that it includes the logarithm of normalized damage both as a main effect and in an interaction with MFI. Model 2b includes the logarithm of normalized damage as a main effect and normalized damage in an interaction with MFI. The table shows the number of predictors and the deviance, the standard measure of fit for models of this kind (2). A smaller deviance indicates a better fit, and differences in deviance between models can be used to calculate tests of statistical significance.

Model 1a fits considerably better than Model 2, although it uses fewer predictors. Testing Model 1a against models 2a and 2b, we cannot reject the hypothesis of no interactions (P=0.33 and 0.29). The estimated effect of MFI in

Model 1a is .024 with a standard error of 0.36, which is not statistically significant (P=0.5): that is, there is no evidence that the masculinity or femininity of the hurricane name affects the number of deaths.

1. Jung K, Shavitt S, Viswanathan M, Hilbe JM (2014) Female hurricanes are deadlier than male hurricanes. *Proc Natl Acad Sci* doi: 10.1073/pnas.1402786111.

2. McCullagh P, Nelder JA (1989) *Generalized Linear Models*, second edition (Chapman Hall, London).

Table 1: Fit of Negative Binomial Regressions Predicting Hurricane Deaths

Model	deviance	number of predictors	predictors
1	136.1	3	pressure, damage, MFI
2	121.8	5	pressure, damage, MFI, MFI × pressure, MFI × damage
1a	97.5	3	pressure, log(damage), MFI
2a	95.3	5	pressure, log(damage), MFI, MFI × pressure, MFI × log(damage)
2b	95.0	5	pressure, log(damage), MFI, MFI × pressure, MFI × damage

N=92 in all models