In this section, we specify a zero-inflated hurdle model, where positive outcomes are modeled using a semi-parametric ordered multinomial model.

Let the response variable be comprised of J unique values in addition to the number zero. We order these unique values and assume that the corresponding values for the transformed response variable is given by . We assume that:

if

if

where is a continuous latent variable, given by:

If , then we assume that:

if

if for j=2,…,J-1

if

where are breaks to be estimated and is a continuous latent variable, given by:

It is important to note that we don’t have any intercept for this model and therefore .

#-------------------------------

FCDs:

* For :

If , then

If , then

* For :
* For (we just sample these for ):

If , then

* For :
* For :

#-------------------------------

Notice that

Further note that for :