Deviance in AIC

$$
\begin{aligned}
\text{AIC} &= \overbrace{-2\log \mathrm{L}(\hat{\boldsymbol{\theta}})}^{\text{deviance}} + 2K \\
&= -2\log[\boldsymbol{y}|\hat{\boldsymbol{\theta}}] + 2K \\
&= -2\log\left[\mathbf{y}|g(\hat{\boldsymbol{\theta}},\mathbf{x}),\sigma^2\right] + 2K \\
&= -2\log\prod_{i=1}^{n}\left[y_i|g(\hat{\boldsymbol{\theta}},x_i),\sigma^2\right] + 2K
\end{aligned}
$$

Note that deviance does not involve prediction. No new values of y are produced and evaluated relative to the data.