$$Bayesian:$$

$$BF_{10}\ gives\ the\ likelihood\ ratio\ of\ rejecting\ the\ null\ in\ favour\ of\ the\ alternative,$$

$$so\ if\ much\ greater\ than\ 1,\ then\ reject\ H_0.\ If\ only\ slightly\ larger\ than\ 1,\ then\ review\ CI.$$

$$You\ start\ with\ the\ likelihood\ distribution,\ and\ the\ prior\ belief\ updates\ the\ likelihood\ to\ the\ posterior.$$

$$This\ means\ that\ the\ posterior\ distribution\ is\ always\ in\ the\ middle\ of\ the\ likelihood\ and\ prior\ distributions$$

$$If\ you\ have\ a\ uniform\ prior\ belief\ (all\ values\ are\ equally\ likely),\ then\ the\ posterior\ equals\ the\ likelihood.$$

$$For\ the\ beta-binomial\ posterior\ distribution,\ the\ prior\ distribution\ parameters\ (a,b)\ are\ pseudocounts,$$

$$i.e.\ a = best\ guess\ of\ number\ of\ 1's\ and\ b = best\ guess\ of\ number\ of\ 0's$$

$$prior\left(\theta = \frac{X}{n}\right):\ beta(a,b)\ or\ beta\ (\alpha,\beta)$$

$$likelihood\ (X\ out\ of\ n\ trials)\ :\ binomial(X,n)$$

$$posterior\left(\theta = \frac{X+\alpha}{\alpha+\beta+n}\right):\ beta(X+\alpha,\ \beta+(n-X))$$

$$prior:\ Beta(1,1)$$

$$likelihood:\ Binomial(X=28,\ n=127)$$

$$posterior:\ Beta(29,\ 100)$$

$$p > 0.5\ ??$$

$$Prior\ distribution\ is\ uniform \Rightarrow likelihood\ is\ equal\ to\ the\ posterior$$

$$\Rightarrow \frac{29}{129} \approx 0.22\ (median)\ and\ sample\ size\ is\ large\ (sharp\ slope),\ so\ \mathbb{P}(p > 0.5) \approx 0$$