In this paper we investigate the impact of uncertainty over the number of false null hypotheses on commonly used \( p \)-value combination methods. Some methods, for example, Tippett’s and Simes’ methods, are powerful when there is only one or a few false individual null hypotheses. Others such as Fisher’s and Stouffer’s methods are powerful when there are many false null hypotheses. Since it is a priori unknown whether a few or almost all individual null hypotheses are false, no uniformly most powerful \( p \)-value combination method exists. We develop a combination of “combinations of \( p \)-values” (CCP) test that maintains good power properties in the presence of such an uncertainty, while at the same time controls type I error. Our test is based on a simple union of rejections decision rule, whereas the joint null hypothesis is rejected at the significance level \( \alpha \) if at least one of the two \( p \)-value combination methods yields a rejection at the level \( \gamma \). The value of \( \gamma \) depends on the significance level, sample size and the correlation of two \( p \)-value combination methods. Our results show that Tippett’s and Simes’ methods are almost perfectly correlated, Fisher’s and Stouffer’ highly correlated, and Simes’(Tippett’s)and Fisher’s (Stouffer’s) almost uncorrelated. (Received August 24, 2010)