Statistical Review:

I see two essential issues in these comments: (1) the reasonableness of combining posterior distributions computed independently by effectively adding those distributions together vs. a formal hierarchical Bayesian implementation, and (2) accommodating the uncertainty associated with the assumptions that go into a complex analysis procedure with relatively messy data.

Regarding issue (1), I am in much more agreement with Farr and Mandell's (F&M) perspective here, in the sense that adding posterior distributions in this context is ad hoc at best and without justification in a coherent probabilistic modeling framework. In contrast, the Bayesian Hierarchical Modeling (BHM) framework is explicitly designed to accommodate this type of aggregation (data and distributions coming from different sources and linked together in a consistent set of conditional probability models). That said, this more rigorous formal treatment essentially confirms the original Schneider et al. findings (which, is often the case – a thoughtful ad hoc approach can often get you in the ballpark).

The second point above is related to the first but has a more general message for complex models with relatively messy data. The parametric model assumptions in F&M can actually induce more uncertainty than a "non-parametric" posterior combination approach. The BHM approach forces one to be clear about these assumptions, and they can be tested or evaluated (as F&M do). This is in contrast to ad hoc procedures, for which it is very difficult to evaluate model assumptions formally.

I note that there is a middle ground here, in which one can use non-parametric Bayesian methods that are much more robust to the specific model form and yet still allow formal uncertainty quantification. More importantly, F&M make the point that there are MANY other assumptions that are made in these analyses and the results can be quite sensitive to them (which, makes sense given one is making inference about the edges of the distribution). The BHM paradigm is arguably the only way to deal with this level of uncertainty in data, process model, and parameters. I think this message is often lost in scientific analyses where the propagation of uncertainty through various analyses stages and the assumption of the underlying model (e.g., data (likelihood) distributions as well as models for processes and parameter distributions).

In conclusion, I think these comments represent a healthy scientific exchange and hopefully, will bring some of these issues to the attention of a broader audience.