

The fallacy of a single active ingredient

1. Consider a PC printer. This is in my head as I write this because of the usual 'have you tried plugging it in... to the computer... to the right computer... and the mains as well... and tried actually switching it on...' thing beloved of tech support people – in this case this summarises my attitude to the mathematical naivety of mental health researchers and practitioners when it comes to the statistics used in their studies.

1. Now consider what is wrong with the following:

1. If all you have is the power cable, then you do not have a working printer, thus you do not need a power cable to get a working printer.

2. If all you have is a toner cartridge, then you do not have a working (laser) printer. Thus you do not need a toner cartridge for your printer to work.

3. But then, if you have a printer without toner or a power cable, you do not have a working (laser) printer either, so you do not need everything but the power-cable and toner to get a working laser printer.

4. Thus there is no such thing as a working printer.

2. It is the same with many things whose utility only arises when a number of correct components are correctly assembled and configured. Indeed there is no complex creation of mankind that isn't like this. So *why do so many mental health practitioners seem to reason in a way which assumes remedies for mental health disorders can be found and tested as if it was only a matter of finding the single correct 'magic' ingredient??*

1. Consider that if the correct toner cartridge for my Kyocera ECOSYS P2135dn was tested out in a Randomised Controlled Trial (and RCT) for remedies for 'out of toner disorder in laser printers', where the eligibility criteria was simply 'laser printer that was out of toner', then most likely it would appear to have negligible benefit in the overall analysis. Moreover, a crude 'drill a hole and stuff more toner in' approach would likely appear to get better results, given the kind of statistical analysis done in contemporary RCTs, than *using the correct toner cartridge for a given printer.*

2. Now RCTs, when properly designed, will *stratify*, to deal with this issue: printers out of toner, and potential replacement toner cartridges, would be stratified according to the make and model of printer, or something like that. Then you'll pretty much see that official toner works slightly better than cheap toner, but basically both work, and other approaches tend to fare far worse.

1. Apply the same common sense to mental health disorders, and you have the problem that essentially *every human being is their own make and model*, and thus *every human being needs to be stratified into a different category from the rest*.
2. If you don't do this, you get a weighted average of multiple distinct categories (that should be stratified to different categories to get meaningful statistical results), and how much the reality of one person or another conforms to the average is something that the results of the RCT will *not* tell you, yet without which, *you cannot tell how relevant the outcome of an RCT is to a given individual*.
3. On a large scale, things can seem to average out, but one can play similar 'amortisation' games given Russian Roulette with live bullets and a sufficient prize for survival!
4. Playing these games in Mental Health is akin to playing a game of Russian Roulette with the patient's lives. Some get the payoff, and others pay the price. To me, the price of these games is not worth it if better approaches exist, or can be developed.