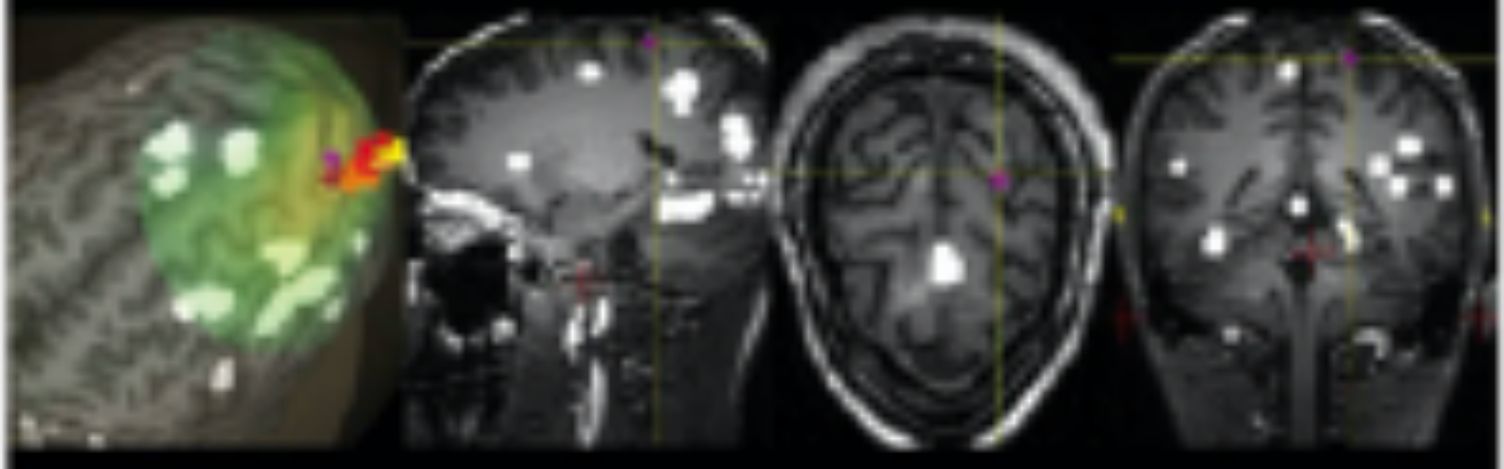
fMRI Methodology

Ruling Out Alternative Explanations

- If we find that region 1 responds more strongly to object A than object B, would you feel comfortable making the claim that must mean region 1 is specialized for object A? Probably not!

- A much stronger argument could be made if we found that region 1 responds more strongly to object A, as compared to a *large* array of other kinds of objects (object B, object C, object D, etc.)

- So we can't rule out the idea the region 1 responds to object A *and* another given object (e.g. object X) until we directly compare activation of region 1 when shown object A, with what happens when shown object X



ESSENTIALS OF COGNITIVE NEUROSCIENCE

Bradley R. Postle

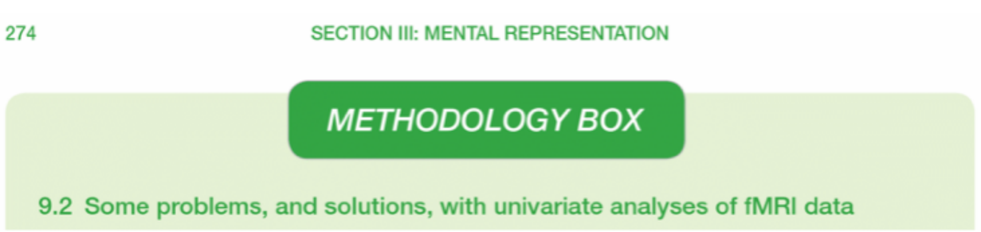
WILEY Blackwell

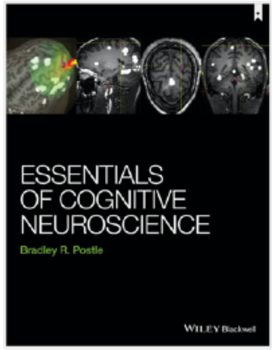
METHODOLOGY BOX

9.2 Some problems, and solutions, with univariate analyses of fMRI data

fMRI Methodology

Ruling Out Alternative Explanations





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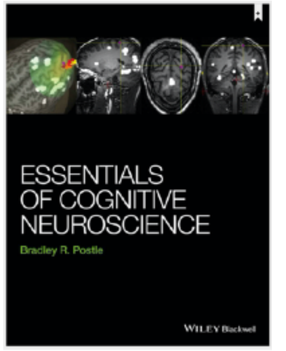

- The real difficulty with this logic is that we can't even get close to testing every other possible comparison we could think of (with every other kind of object that exists in the world)
- We therefore have to be practical and at some point say the balance of evidence is enough to support a claim like the FFA is specialized for responding to faces, without going overboard but with enough data to feel confident
  - e.g. the scientific community didn't test whether gravity stops working in every possible conceivable situation on earth before accepting it as a concept… rather, at some point, enough evidence was gathered to come to a consensus that it's a 'real thing', with reliable properties, that we can count on