effect very close to zero? Or are there versions of the effect with different signs? However, if we report $\mathcal{I}_c$ and $\mathcal{I}_v$ we have evidence against Fisher's sharp null, narrowing the plausible explanations for why zero is contained in $\mathcal{I}_v$, which we've noted will tend to be similar to $\mathcal{I}_*$.

5.3 Interval estimates in the football study

The upper third of Figure 1, marked $\Gamma = 1$, shows 95% intervals for the football study, assuming that treatments are randomly assigned within matched sets. First, there are the three conventional intervals for τ, τ^a, and τ^b, corresponding to the three comparisons in Table 1. Each of these intervals is a 95% confidence interval on its own, but each one runs a 5% chance of error, so the chance that at least one interval fails to cover its corresponding parameter is greater than 5%. Obviously, we could make the three intervals longer, say using the Bonferroni inequality, so that the simultaneous coverage is 95%, but many investigators would find this unattractive because it would reduce the power of the conventional, primary analysis focused on τ that uses all of the controls; that is, it would make the first interval longer.

In contrast, the intervals $\mathcal{I}_c$ and $\mathcal{I}_v$ in Figure 1 have simultaneous coverage of 95% in the sense of Proposition 1. Notably, $\mathcal{I}_c = [-0.308, 0.099]$ is the interval for τ from §4, so consideration of $\mathcal{I}_v$ has not reduced power to detect a constant effect. The versions $\mathcal{I}_v = [-0.357, 0.219]$ is slightly longer than $\mathcal{I}_c$, but both intervals are compatible with no effect and both intervals are quite incompatible with an effect of half a word, ± 0.5. For comparison, recall from §2 that average performance on the delayed word recall test declined by half a word from age 65 to age 72. In Figure 1, the 95% interval for "all controls" equals $\mathcal{I}_c$, while $\mathcal{I}_v$ is the union of the three intervals for "all controls", "controls who played no sport", and "controls who played another sport".