Extremely quick update on `bootstrap_variance_2.pdf`:

In going from (11) to (12), I note that I'm not entirely certain about the conversion of notation. This was for good reason, as I was wrong. Note:

$$\sum_{W_i=1} \widehat{Y_i(0)}^2 \neq \sum_{W_i=0} K_i^2 Y_i^2 \tag{1}$$

This is because simply replacing $\widehat{Y_i(0)}$ with $K_i Y_i$ is not valid. Only the statement $\sum \widehat{Y_i(0)} = \sum K_i Y_i$ is valid. The sum of $\widehat{Y_i(0)}^2$ is properly represented as $\sum_{W_i=0} K_i Y_i^2$. This squares every $Y_i(0)$, and zeroes out those which are not matched to anything.

Thus, (13) becomes:

$$E\left[\frac{1}{N_1^2}\sum_{W_i=1}\left(Y_i(1) - \widehat{Y_i(0)} - \hat{\tau}\right)|X, W\right] = \frac{1}{N_1^2}\sum_{W_i=0} K_i - \frac{1}{N_1^3}\sum_{W_i=0} K_i^2 \tag{2}$$

This is rather worse in the sense it is much farther from what it should be - but (2) can under- *and* over-estimate the proper variance ($\frac{1}{N_1^2}\sum K_i^2$), and can do so by large enough amounts to potentially match my simulation results.