We can observe two main properties:

(I) $p_\psi(\boldsymbol{\epsilon})$ is independent of $\psi \implies \nabla_x log(p_\psi(\boldsymbol{\epsilon})) = 0 \implies \mathbf{g}^{corr} = 0$

(II) $T(\boldsymbol{\epsilon}, \psi) = \mathcal{I}d(\boldsymbol{\epsilon}) \implies \nabla_\psi \mathbb{E}_{q_\psi(\mathbf{z})}[f(\mathbf{z})] = \mathbb{E}_{q_\psi(\mathbf{z})}[f(\mathbf{z}) \nabla_\psi log(q_\psi(\mathbf{z}))]$