$$\frac{\bar{X} - \mu}{(S/\sqrt{n})} \rightarrow T = \frac{Z}{\sqrt{V/r}} \qquad \begin{array}{l} Z \sim N(0,1) \\ V \sim \chi^2(r) \\ Z \perp V \end{array}$$

T has pdf

$$f(x) = \frac{\Gamma\left(\frac{r+1}{2}\right)}{\Gamma\left(\frac{r}{2}\right)\sqrt{\pi r}} \left(1 + \frac{x^2}{r}\right)^{-\left(\frac{r+1}{2}\right)} \qquad X \in (-\infty, \infty)$$

If $r > 1$, $E[T] = 0$.

If $r > 2$, $var(T) = \frac{r}{r-2}$

$$\lim_{r \to \infty} T = Z$$

When r is (large) ~ ? 30

$$T \approx Z$$