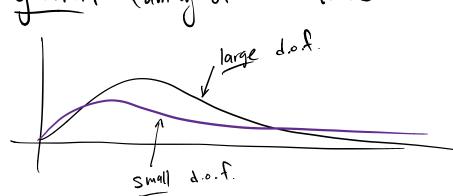
Confidence Intervals on Variance

· we need get another new distribution!

Chi-Squared

· not Caussian

- gamma Camily of distributions



note: not Symmetrical about Zero like Gaussian

 $\sqrt{\frac{2}{s_1^2}} = \frac{(n-1)s_1^2}{\sigma^2}$

ratio of s to o'2, rather

than difference x-u

.. biggest difference between using X2 and 2 or t: Separate upper and lower X2 values. [instead of, for example, = 7 x/2] on (1-1) + 100% confidence interval on of, $\frac{(n-1)s^2}{\gamma^2}$ < o^2 < $\frac{(n-1)s^2}{\sqrt{\frac{2}{1-a/2},n-1}}$ two separate values !upper one-sided confidence bound: a, not 4/2 lower:

ex: random sample of n = 20 bottles S= 0.0153 (A1.02)

- if variance of fill volume is too high, too many boiles will be over - or under-filled

- Using this rationale, construct 95% upper confidence bound on population standard deviation of fill volume

Q = 0.05 $Q = \frac{(N-1)s^2}{x^2}$ $\frac{(N-1)s^2}{x^2}$ $\frac{(N-1)s^2}{x^2}$

need $\sqrt{.95}$, 19 = 10.12

$$0^{2}$$
 $< \frac{19.0.0153}{10.12}$
 0^{2} < 0.0287

Variance; we want standard deviation
 0^{2} $< \sqrt{0.0287}$ $+ 0.17(fl.02)$