Calculating Cohen's κ

Ratings for "Family" category present ("yes") in narratives (*N*=43 narratives total), from *k*=2 different raters. Expected frequencies (*E*) for the number of agreements expected by chance (row total * column total/overall total) in parentheses.

		Rater 2		
		"No"	**"Yes"**	R_i
Rater 1	**"No"**	20 (15.6)	4	24
	"Yes"	8	11 (6.6)	19
	C_j	28	15	*N*=43

$$P_{agreement} = \sum_{i=1}^{k} O_{ii} / N = (20+11)/43 = 0.72$$

$$P_{chance} = \sum_{i=1}^{k} \left(\frac{R_i}{N}\right)\left(\frac{C_i}{N}\right) = \frac{28}{43} * \frac{24}{43} + \frac{15}{43} * \frac{19}{43} = .52$$

$$= \sum_{i=1}^{k} \left(\frac{E_i}{N}\right) = \frac{15.6}{43} + \frac{6.6}{43} = .52$$

$$\kappa = \frac{P_{agreement} - P_{chance}}{1 - P_{chance}} = \frac{0.72 - .52}{1 - .52} = 0.42$$

$$S.E.(\kappa) = \left(\frac{P_C + P_C^2 - U}{N(1-P_C)^2}\right)^{1/2}, U = \sum_{i=1}^{k} \frac{R_i^2 C_i + R_i C_i^2}{N^3}$$