Teeth erosion

a case-control study carried out among swimmers to investigate the possible association between exposure to chlorinated swimming pool water and erosion of dental enamel. Among 49 swimmers with enamel erosion (the cases) 32 reported swimming six or more hours per week, compared with 118 of 245 swimmers without enamel erosion (the controls).

2x2

time	erosion	controls	
> 6h	32	118	
< 6h	17	127	
total	49	245	294

H0...

n	294	ad-bc	2058
a	32	a+b	150
b	118	b+d	245
c	17	a+c	49
d	127	c+d	144

there is no correlataion between dental errotion and swimming

(ad-bc)^2	4235364
N(ad-bc)^2	1245197016
(a+b)(a+c)(b+d)(c+d)	259308000
chi2	4.802
critical value	3.841458821

null hypothesis is rejected

$$X^2 = \frac{N(ad - bc)^2}{(a + b)(a + c)(b + d)(c + d)}.$$

	Math. Mag.	Science	
math	5	0	$R_1 = 5$
biology	1	4	$R_2 = 5$
	$C_1 = 6$	$C_2 = 4$	$N = 10.$

Computing P_{cutoff} gives

$$P_{\text{cutoff}} = \frac{5!^2\, 6!\quad 4!}{10!\,(5!\quad 0!\quad 1!\quad 4!)} = 0.0238,$$

and the other possible matrices and their Ps are

$$\begin{bmatrix} 4 & 1 \\ 2 & 3 \end{bmatrix} P = 0.2381$$

$$\begin{bmatrix} 3 & 2 \\ 3 & 2 \end{bmatrix} P = 0.4762$$

$$\begin{bmatrix} 2 & 3 \\ 4 & 1 \end{bmatrix} P = 0.2381$$

$$\begin{bmatrix} 1 & 4 \\ 5 & 0 \end{bmatrix} P = 0.0238,$$

which indeed sum to 1, as required. The sum of P-values less than or equal to P_{cutoff} = case, there would be a statistically significant association between the journal and type

$= 0.0238$ is then 0.0476 which, because it is less than 0.05, is significant. Therefore, in this
of article appearing.