# Seasonal effects in peer review processes?

**Marcel Ausloos**

**Olgica Nedić**

**Aleksandar Dekanski**

# Two questions

- **Are seasonal effects found in paper submission flow to peer review journals?**
- **Are subsequent rejections depending on the submission month?**

**=**

**A case study comparing a specialized to a general readership journal.**

# Shalvi et al. (2010)

- *Psychological Science* (PS)
- *Personality and Social Psychology Bulletin* (PSPB)
- high number of submissions to PS during the summer months
- winter drop in the submission to PSPB
- attribute behavioral differences to editorial policy, - rather than to authors or reviewers.

# Alikhan et al. (2011)

- 20 journals pertaining to dermatology
- May was the least popular month
- July was the most popular month

- $\chi 2 \approx 36.27$
  - for 11 degrees of freedom $\chi^2_{(11)} \approx 4.57$.

# Schreiber (2012)

- *Europhysics Letters* (EPL), from 1999 to 2010
- visible maximum for submissions in July
- marked dip in February

- claims no statistical effect !
- but $\chi 2$ goes from ≈ 5.57 to ≈ 13.55

# Schreiber (2012)

- *Europhysics Letters* (EPL), from 1999 to 2010
- acceptance rate : ranging between 45% and 55%,
- marked minimum in January
- maximum in July

- visible statistical outliers !
- but $\chi 2$ goes from ≈ 0.86 to ≈ 2.58

# others

- J. Hartley, Write when you can and submit when you are ready! (2011).
- L. Bornmann and H.-D. Daniel, Seasonal bias in editorial decisions? A study using data from chemistry (2011). *(no effect)*
- M. Antonoyiannakis, Acceptance rates in Physical Review Letters: no seasonal bias (2014).
- …

- *Journal of the Serbian Chemical Society* (*JSCS*)
  - 600 submitted papers
  - 2 years
- *Entropy*
  - 2500 submitted papers
  - 3 years

# Methodology

- Absolute values
- Time series or (and) Cumulated series

- Relative values
  - normalization !!!
- Time series or (and) Cumulated series

# definitions

- $p_i^{(s)} = N_i^{(s)} / \Sigma_i N_i^{(s)}$
- $p_i^{(a)} = N_i^{(a)} / \Sigma_i N_i^{(a)}$
- $q_i^{(a)} = N_i^{(a)} / \Sigma_i N_i^{(s)}$
- $r_i^{(a)} = p_i^{(a)} / p_i^{(s)}$
- $R_i^{(a)} = N_i^{(a)} / \Sigma_i N_i^{(s)}$
- $Q_i^{(a)} = N_i^{(a)} / N_i^{(s)}$

- … idem for
  - reviewer rejected, desk rejected, withdrawn papers

# watch out

- $Q_i^{(a)} + Q_i^{(rr)} + Q_i^{(dr)} + Q_i^{(w)} = Q_i^{(s)}$

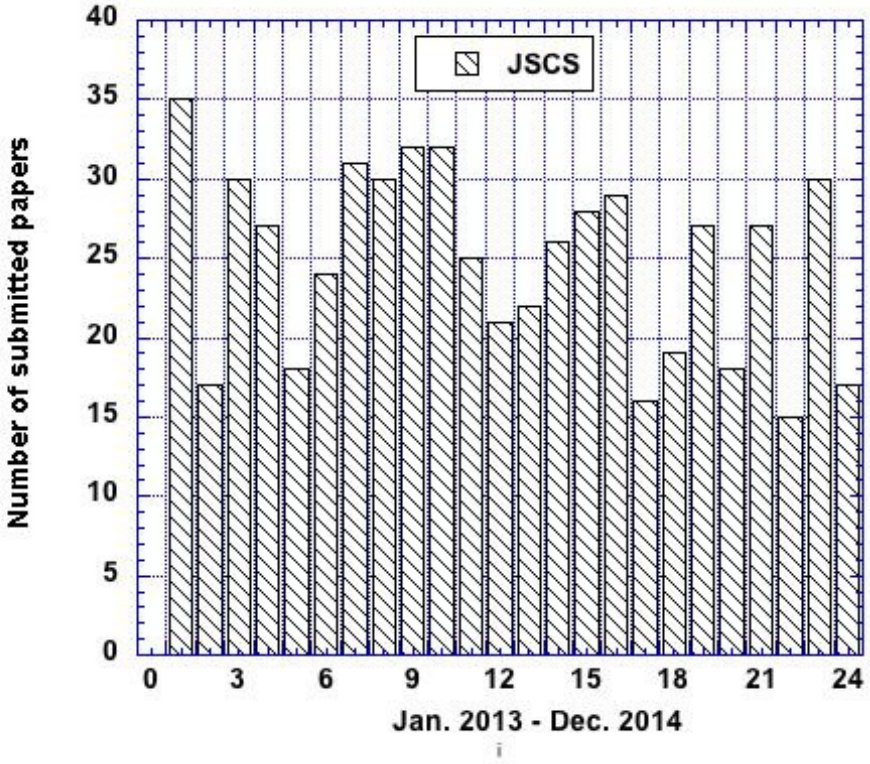
because the only truth is :

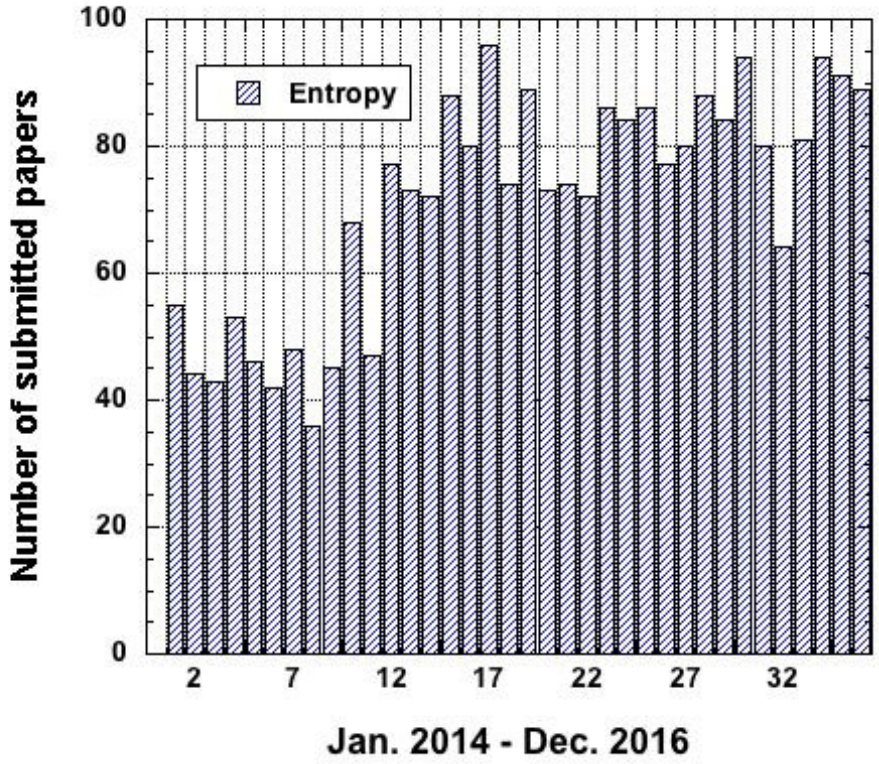
- $N_i^{(a)} + N_i^{(rr)} + N_i^{(dr)} + N_i^{(w)} = N_i^{(s)}$

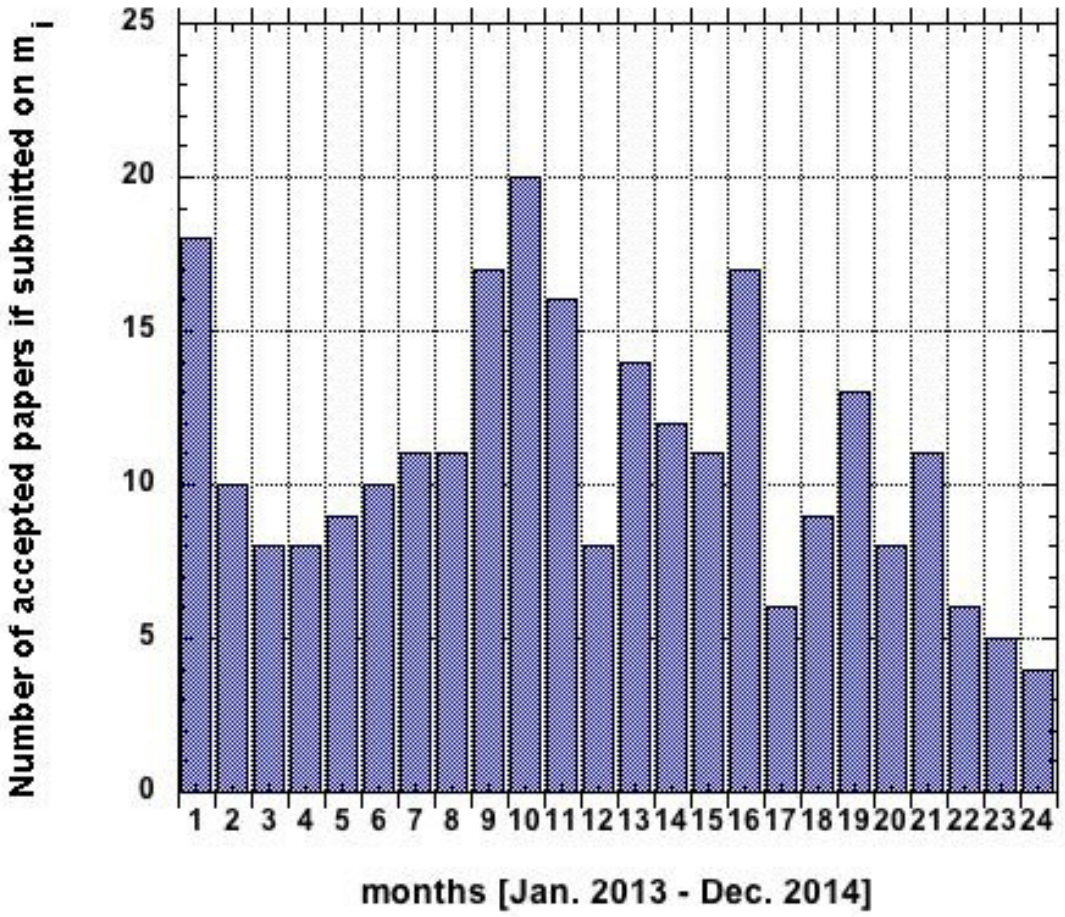
- $p_i^{(a)} + p_i^{(r)} =/= p_i^{(s)}$

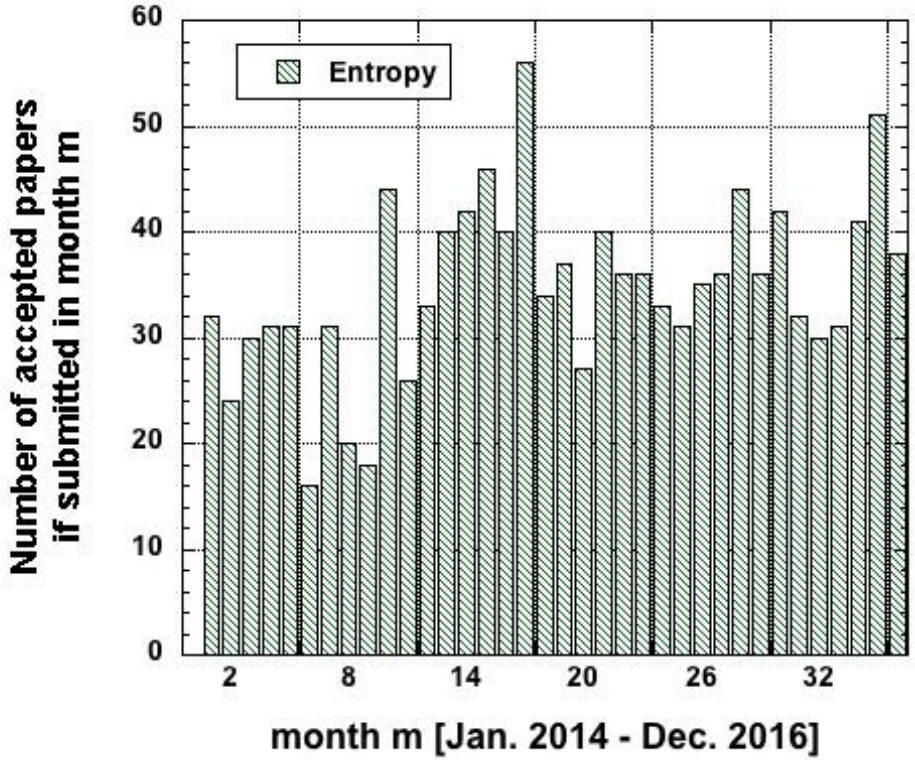
but

- $p_i^{(a)} - p_i^{(r)} = ?$


JSCS
Number of submitted papers
Jan. 2013 - Dec. 2014
0
5
10
15
20
25
30
35
40
0
3
6
9
12
15
18
21
24


Entropy
Number of submitted papers
100
80
60
40
20
0
2
7
12
17
22
27
32
Jan. 2014 - Dec. 2016


Number of accepted papers if submitted on m i
25
20
15
10
5
0
1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19 20 21 22 23 24
months [Jan. 2013 - Dec. 2014]

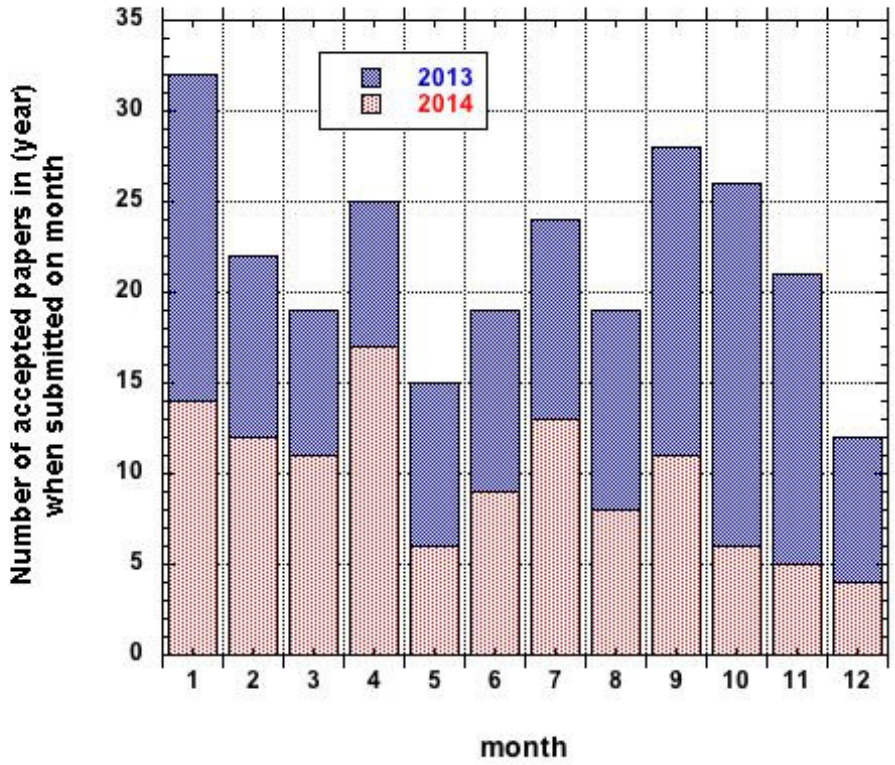

Entropy
Number of accepted papers
if submitted in month m
month m [Jan. 2014 - Dec. 2016]
0
10
20
30
40
50
60
2
8
14
20
26
32

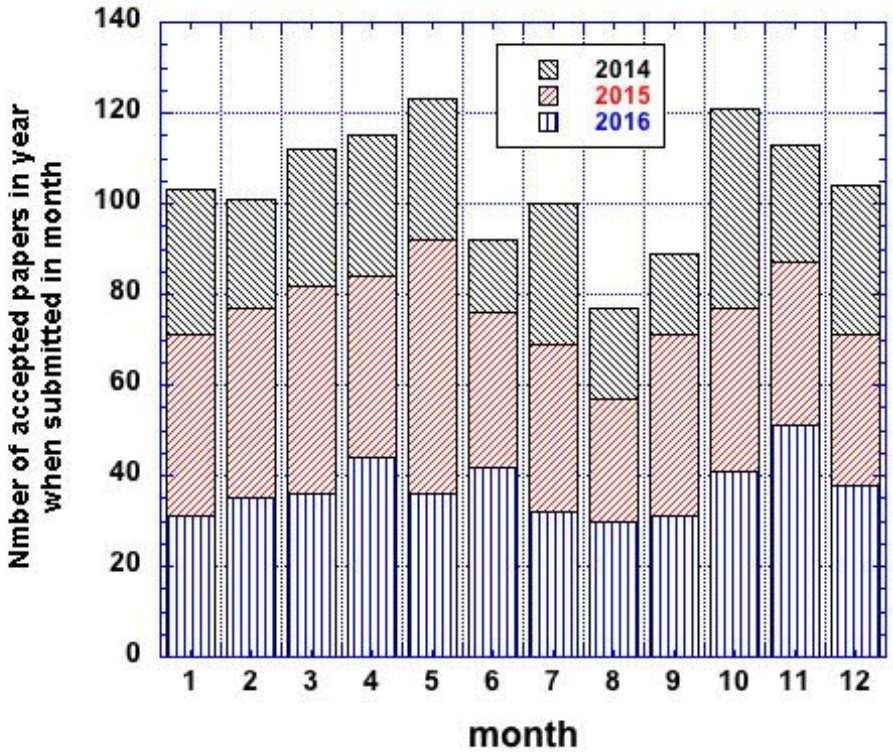
# *JSCS* statistics

| *JSCS* | N submitted ($N_s$) | | N accepted ($N_a$) | |
|---|---|---|---|---|
| Year | 2013 | 2014 | 2013 | 2014 |
| Min. | 17 | 15 | 8 | 4 |
| Max. | 35 | 30 | 20 | 17 |
| Total | 322 | 274 | 146 | 116 |
| Mean ($\mu$) | 26.833 | 22.833 | 12.167 | 9.667 |
| Std. Dev. ($\sigma$) | 5.8595 | 5.5732 | 4.3450 | 4.0076 |
| Skewness | -0.4300 | -0.1377 | 0.6669 | 0.2111 |
| Kurtosis | -1.0609 | -1.6261 | -1.1253 | -0.9704 |
| $\mu-2\,\sigma$ ; $\mu+2\,\sigma$ | 15.114 ; 38.552 | 11.687 ; 33.980 | 3.477 ; 20.857 | 1.652 ; 17.682 |
| $\chi^2$ | 14.075 | 14.964 | 17.068 | 18.276 |
| $\chi^2$ (11} (0.95 %) | 4.5748 | | | |

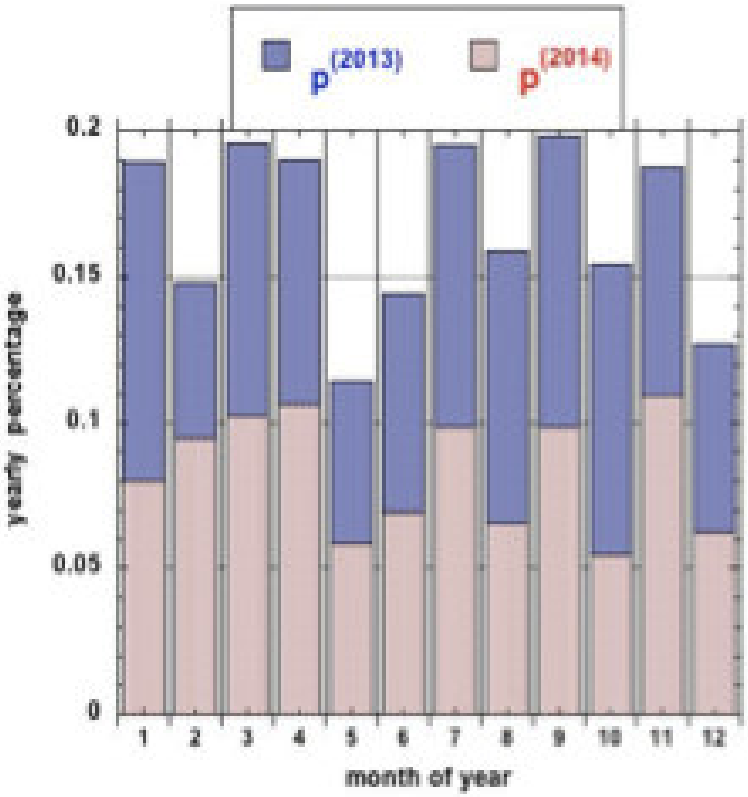
# *Entropy* statistics

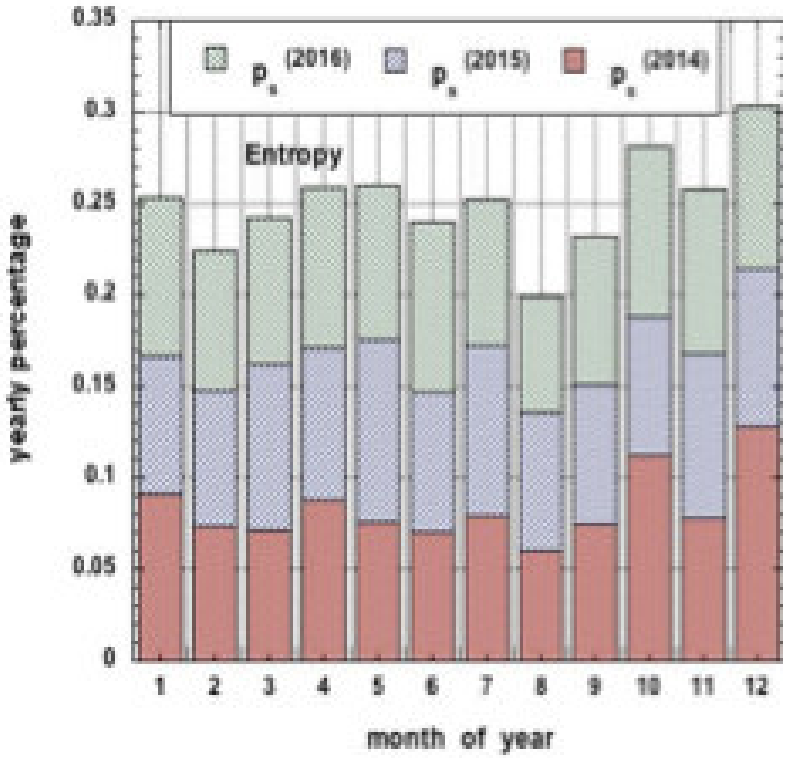
| *Entropy* | N submitted ($N_s$) | | | N accepted ($N_a$) | | |
|---|---|---|---|---|---|---|
| Year | 2014 | 2015 | 2016 | 2014 | 2015 | 2016 |
| Min. | 36 | 72 | 64 | 16 | 27 | 30 |
| Max. | 77 | 96 | 94 | 44 | 56 | 51 |
| Total | 604 | 961 | 1008 | 336 | 467 | 447 |
| Mean ($\mu$) | 50.33 | 80.08 | 84.00 | 28.00 | 38.92 | 37.25 |
| Std. Dev. ($\sigma$) | 11.618 | 8.2623 | 8.4423 | 7.722 | 7.242 | 6.312 |
| Skewness | 1.2197 | 0.5534 | -0.9402 | 0.2190 | 0.8248 | 0.7696 |
| Kurtosis | 0.5738 | -1.0378 | 0.6370 | -0.1618 | 0.9630 | -0.1801 |
| $\mu-2\,\sigma$ | 27.098 | 63.559 | 67.115 | 12.555 | 24.433 | 24.626 |
| $\mu+2\,\sigma$ | 73.569 | 96.608 | 100.88 | 43.445 | 53.401 | 49.874 |
| $\chi^2$ | 29.4969 | 9.3767 | 9.3333 | 23.4286 | 14.8243 | 11.7651 |
| $\chi^2$ (11}(0.95 %) | 4.5748 | | | | | |

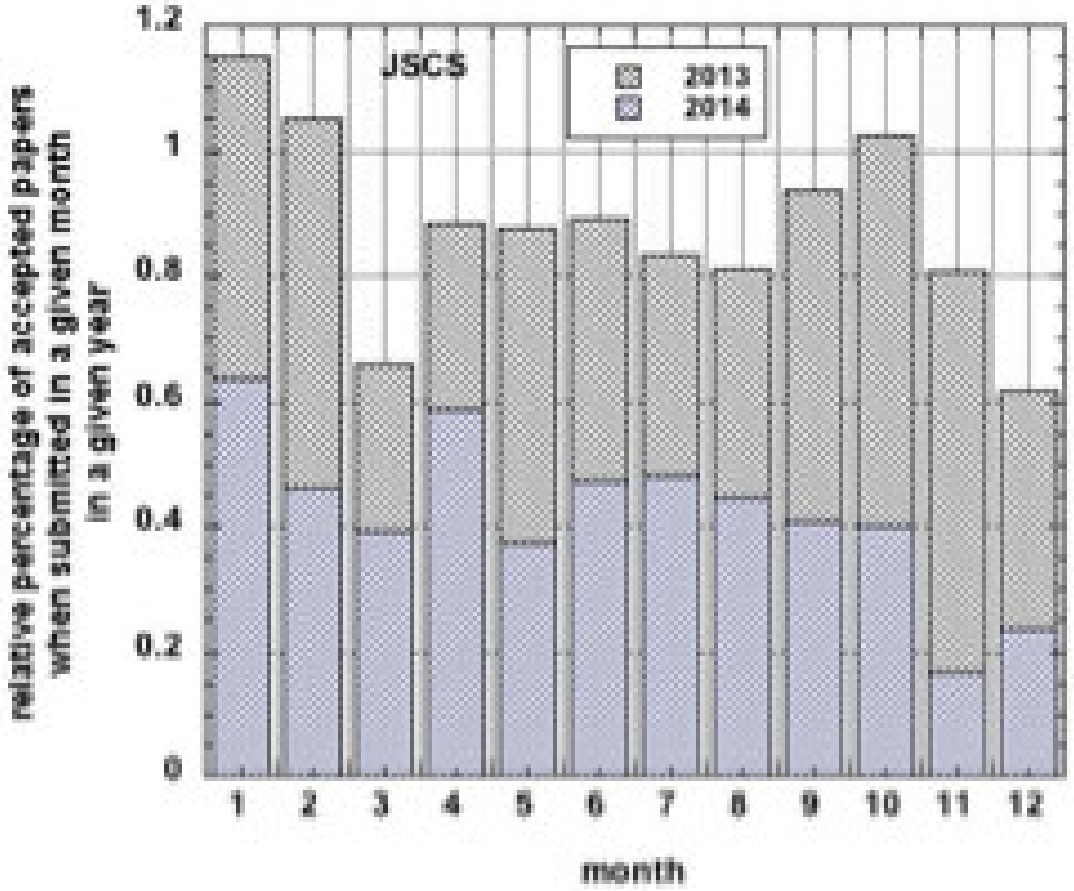

Number of accepted papers in (year)
when submitted on month
2013
2014
0
5
10
15
20
25
30
35
1
2
3
4
5
6
7
8
9
10
11
12
month


Nmber of accepted papers in year
when submitted in month
140
120
100
80
60
40
20
0
1
2
3
4
5
6
7
8
9
10
11
12
month
2014
2015
2016

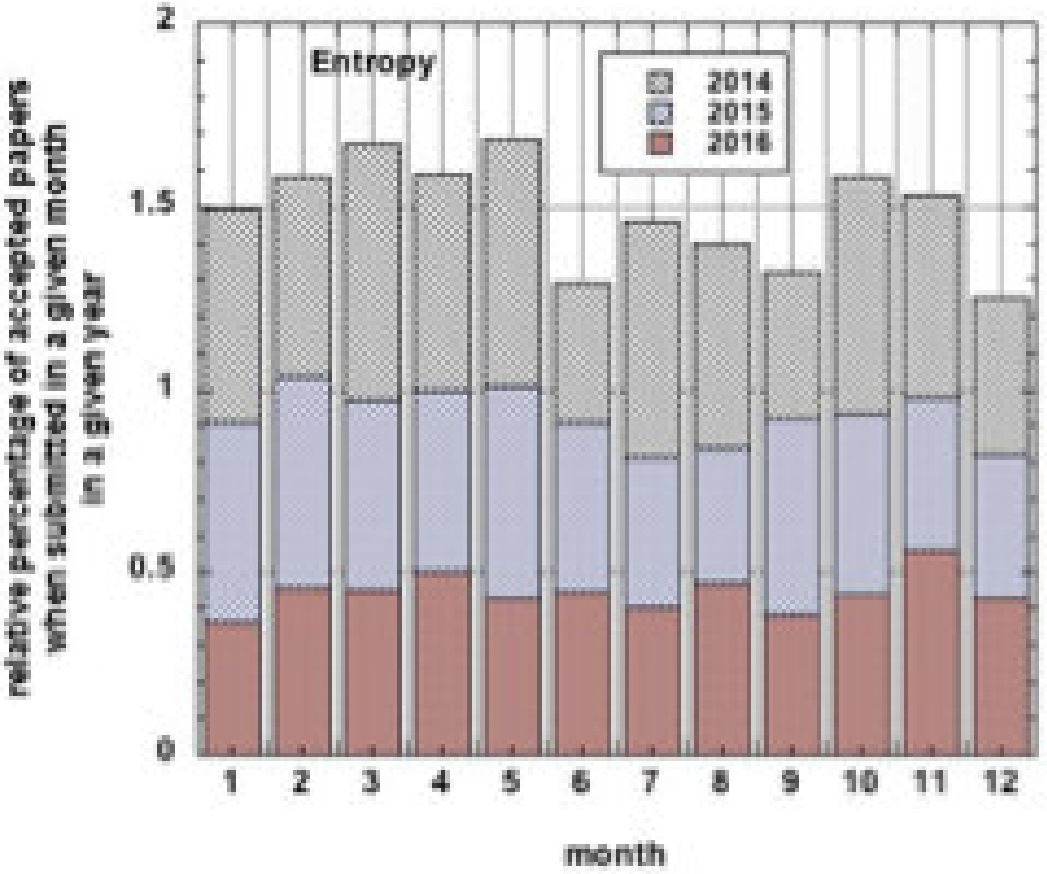
# probability of submission

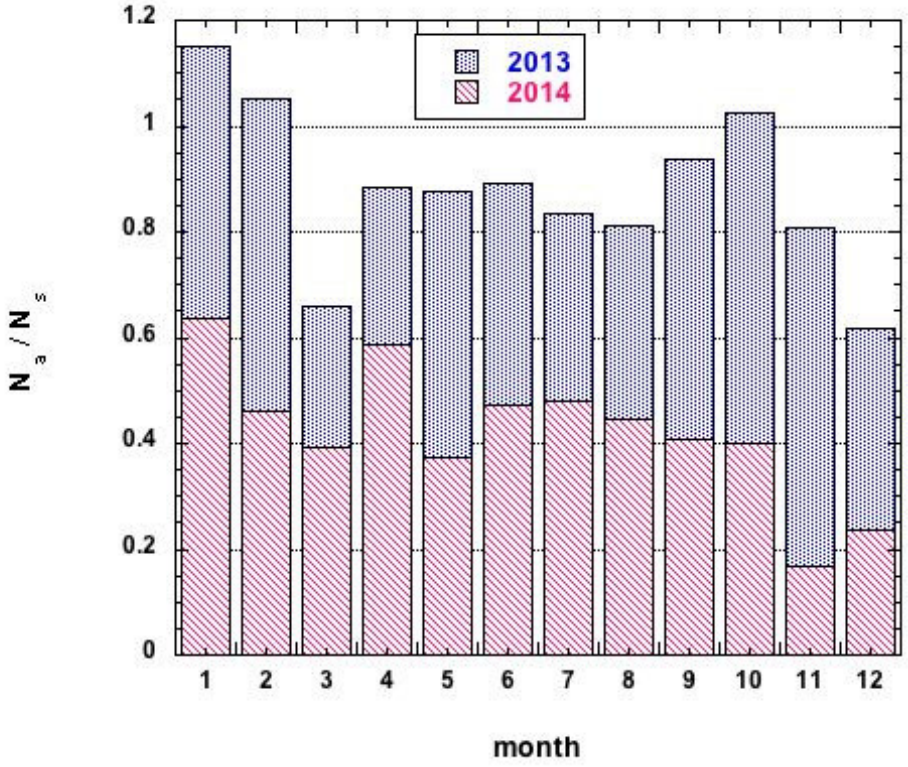


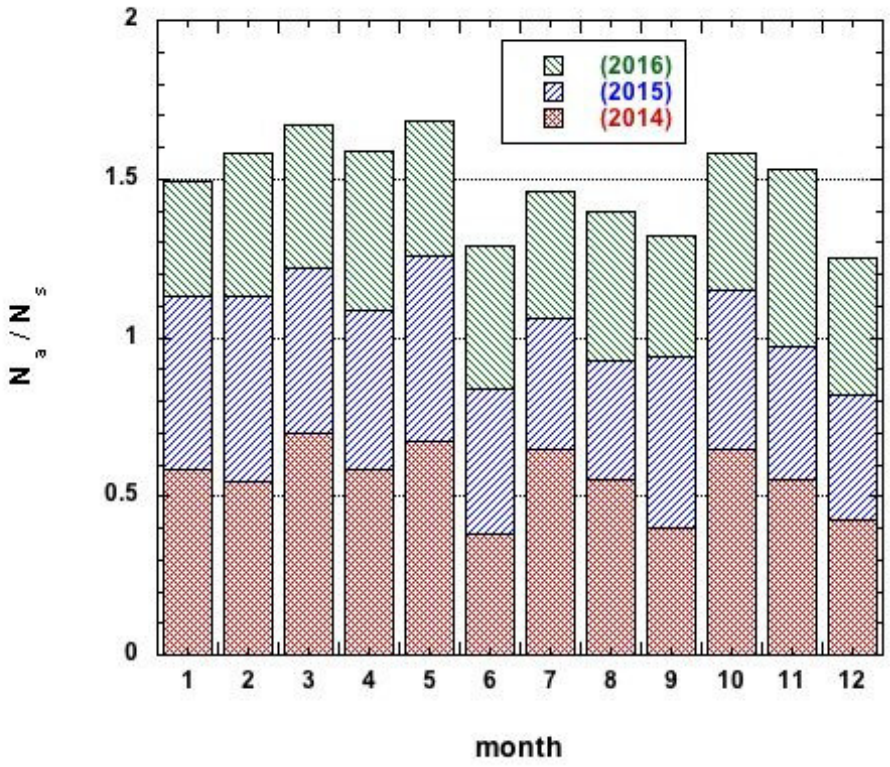



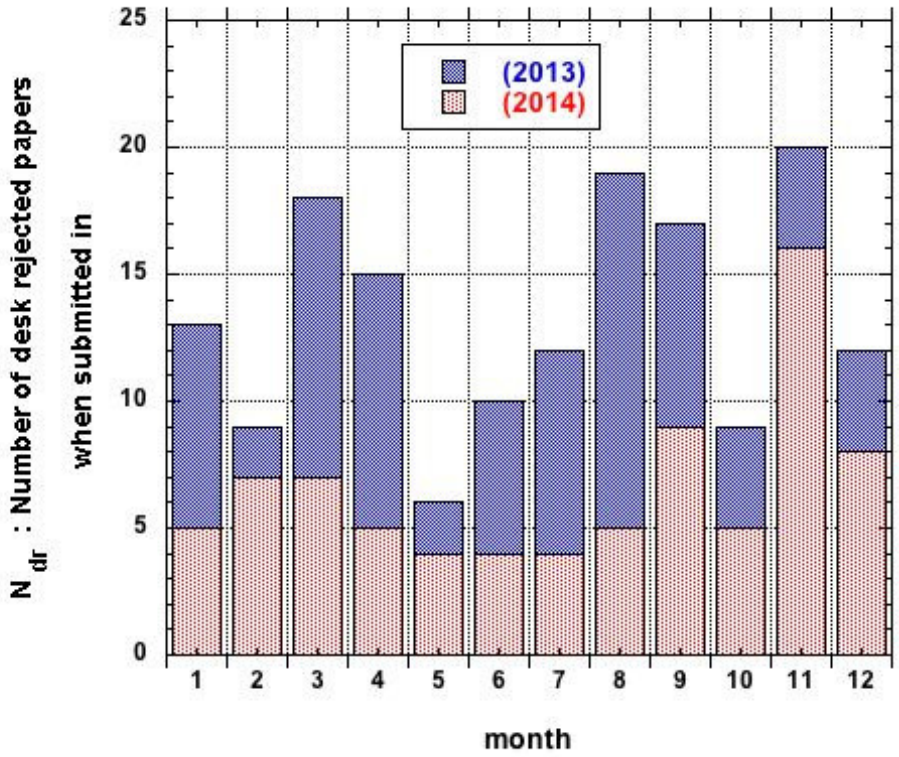

JSCS
2013
2014
relative percentage of accepted papers
when submitted in a given month
in a given year
1.2
1
0.8
0.6
0.4
0.2
0
1
2
3
4
5
6
7
8
9
10
11
12
month

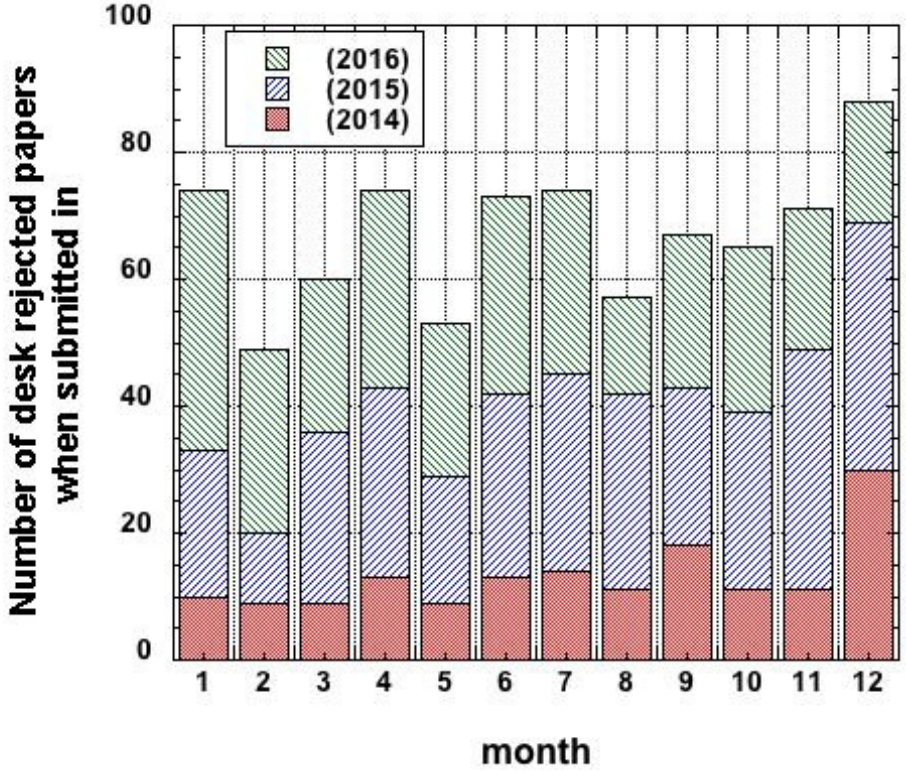
?!


Entropy
2014
2015
2016
relative percentage of accepted papers
when submitted in a given month
in a given year
2
1.5
1
0.5
0
1
2
3
4
5
6
7
8
9
10
11
12
month

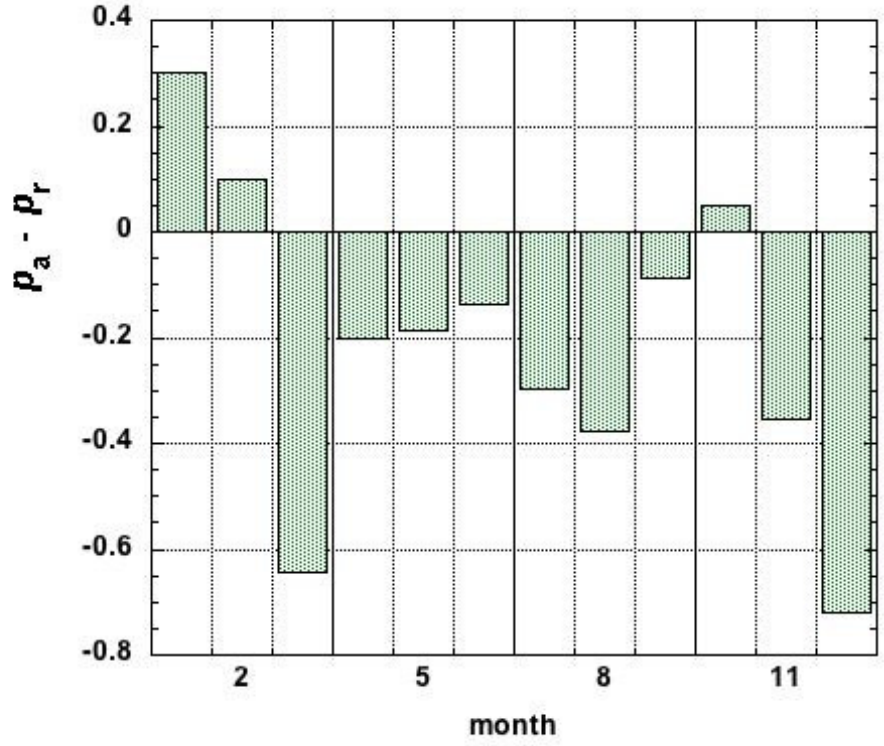

2013
2014
$N_a / N_s$
month
0
0.2
0.4
0.6
0.8
1
1.2
1
2
3
4
5
6
7
8
9
10
11
12


(2016)
(2015)
(2014)
$N_a / N_s$
month
0
0.5
1
1.5
2
1
2
3
4
5
6
7
8
9
10
11
12

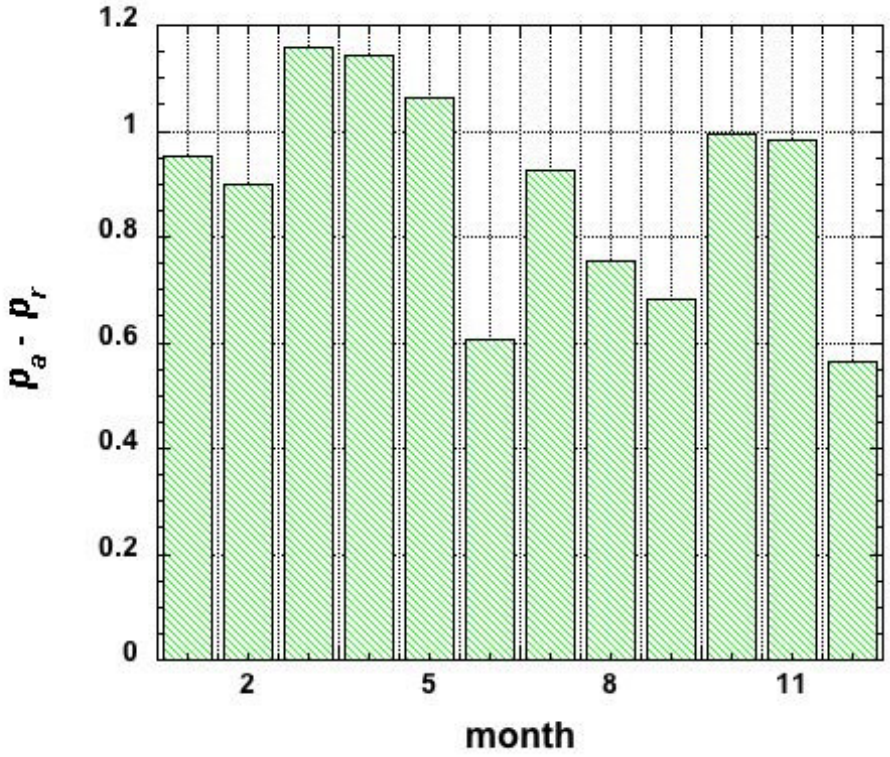

(2013)
(2014)
$N_{dr}$ : Number of desk rejected papers
when submitted in
month
0
5
10
15
20
25
1
2
3
4
5
6
7
8
9
10
11
12


Number of desk rejected papers when submitted in
(2016)
(2015)
(2014)
100
80
60
40
20
0
1
2
3
4
5
6
7
8
9
10
11
12
month

# $p_a - p_r = (N_a - N_r)/N_s$ JSCS



# $p_a - p_r = (N_a - N_r)/N_s$ Entropy



# conclusions

- S : number or rate depends on journal
- A : number or rate depends on journal
- A/S : number or rate depends on journal

- why ? indeed, specialized vs. general

… thus, make a study before submitting

# Further work ?

- Still much to do
- Exogenous causes ?
  - Sunspots ?
  - Moon phases ?

- Quality effect ?
  - number of citations:
    - but is it quality or popularity?
    - beware of sleeping beauties

Please applaude now

thanks

$$N_s / \Sigma_i N_s^{(i)} \qquad i = [1 ; 12]$$