il mito del p-value

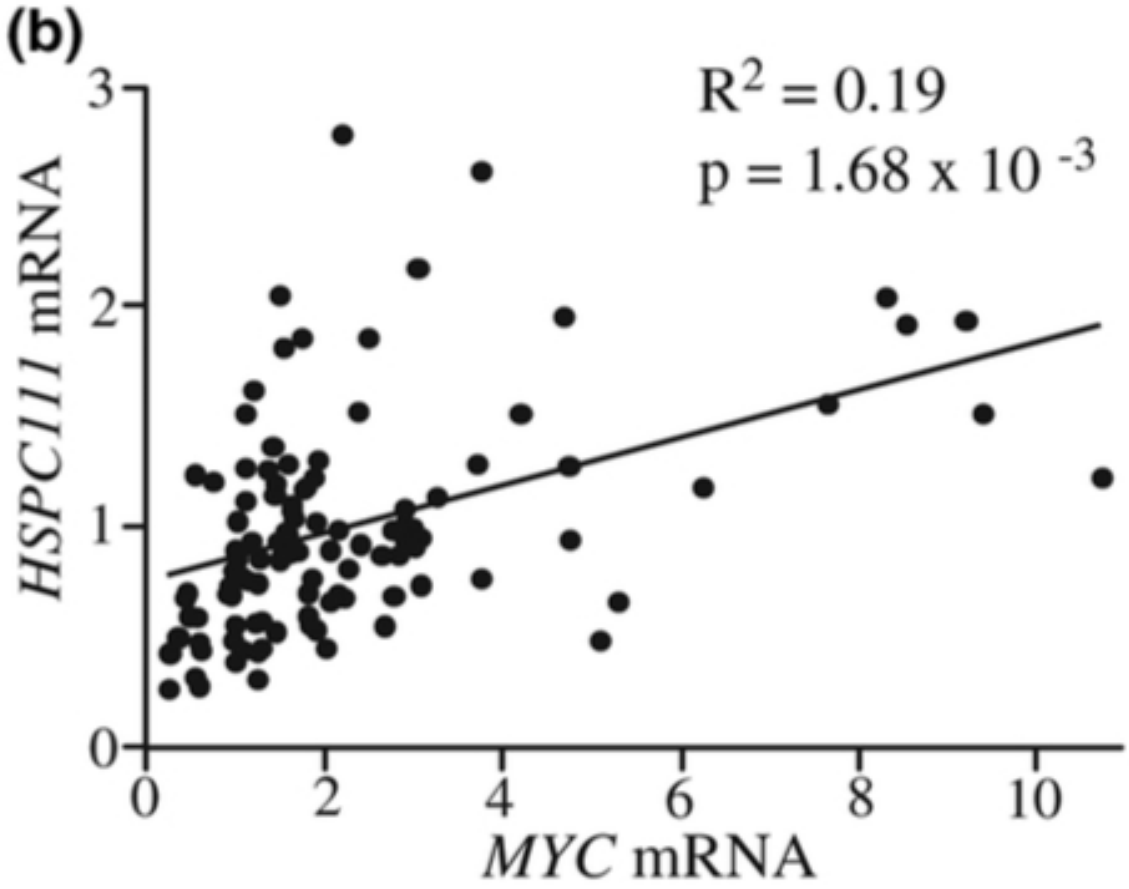
- Test del X^2
- Test esatto di Fisher
- Test sulla differenza tra due popolazioni
- Test t di Student per campioni indipendenti
- Test t di Student per dati appaiati
- Test ANOVA
- Test di Mann-Whitney
- Test di Wilcoxon
- Test di Kruskal Wallis
- log rank test
- Test di Shapiro Wilk
- …

Research article

Open Access

The estrogen and c-Myc target gene *HSPC111* is over-expressed in breast cancer and associated with poor patient outcome

Alison J Butt[1,2], C Marcelo Sergio[1], Claire K Inman[1], Luke R Anderson[1], Catriona M McNeil[1], Amanda J Russell[1], Marco Nousch[3], Thomas Preiss[3], Andrew V Biankin[1,2], Robert L Sutherland[1,2] and Elizabeth A Musgrove[1,2]



Human Pathology (2008) 39, 1827–1834

ELSEVIER

Human PATHOLOGY

www.elsevier.com/locate/humpath

Original contribution

Clinicopathologic significance of mitotic arrest defective protein 2 overexpression in hepatocellular carcinoma☆,☆☆

Shu-Hui Zhang MD[a,*], Ai-Min
Man-Ping Sun[a], Yu-Jia Wang[

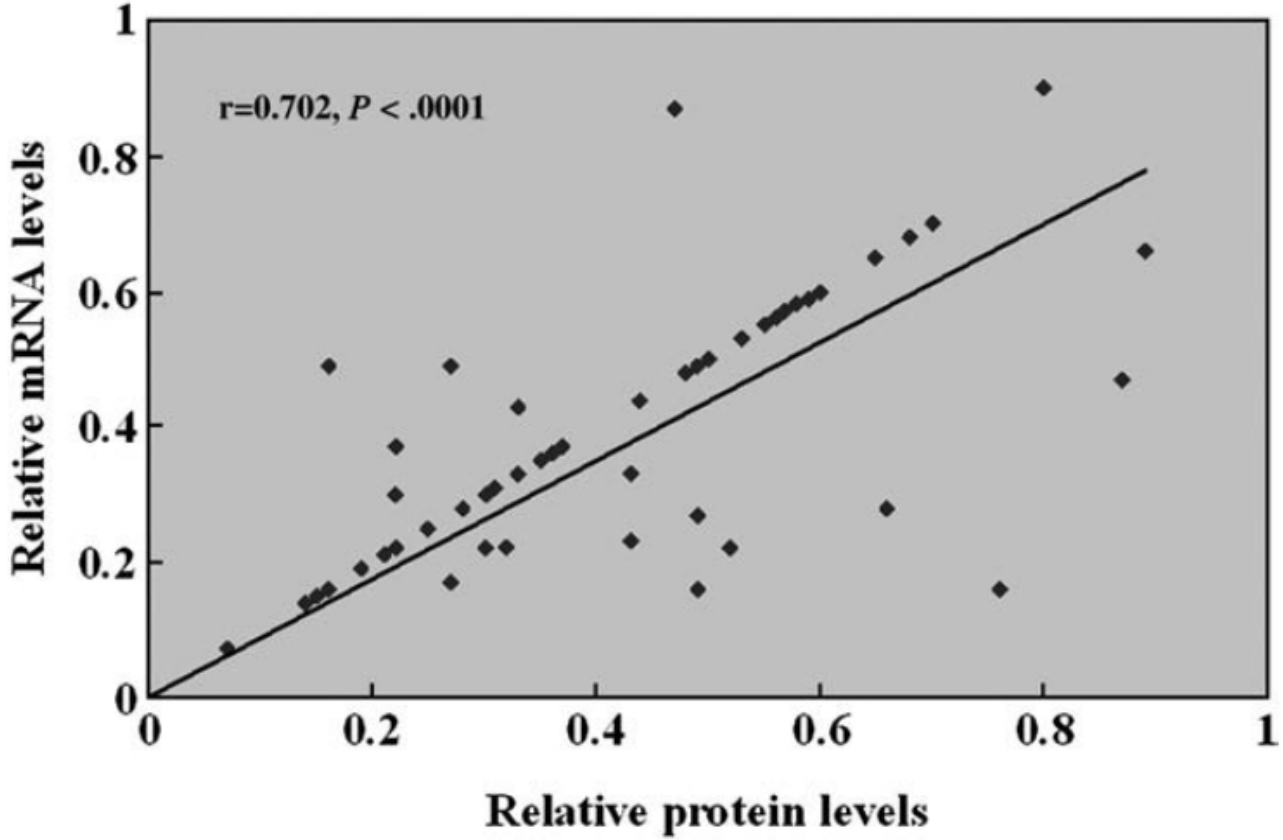


Fig. 3 Relationship between relative mRNA and protein expression of MAD2 in hepatocellular carcinoma.

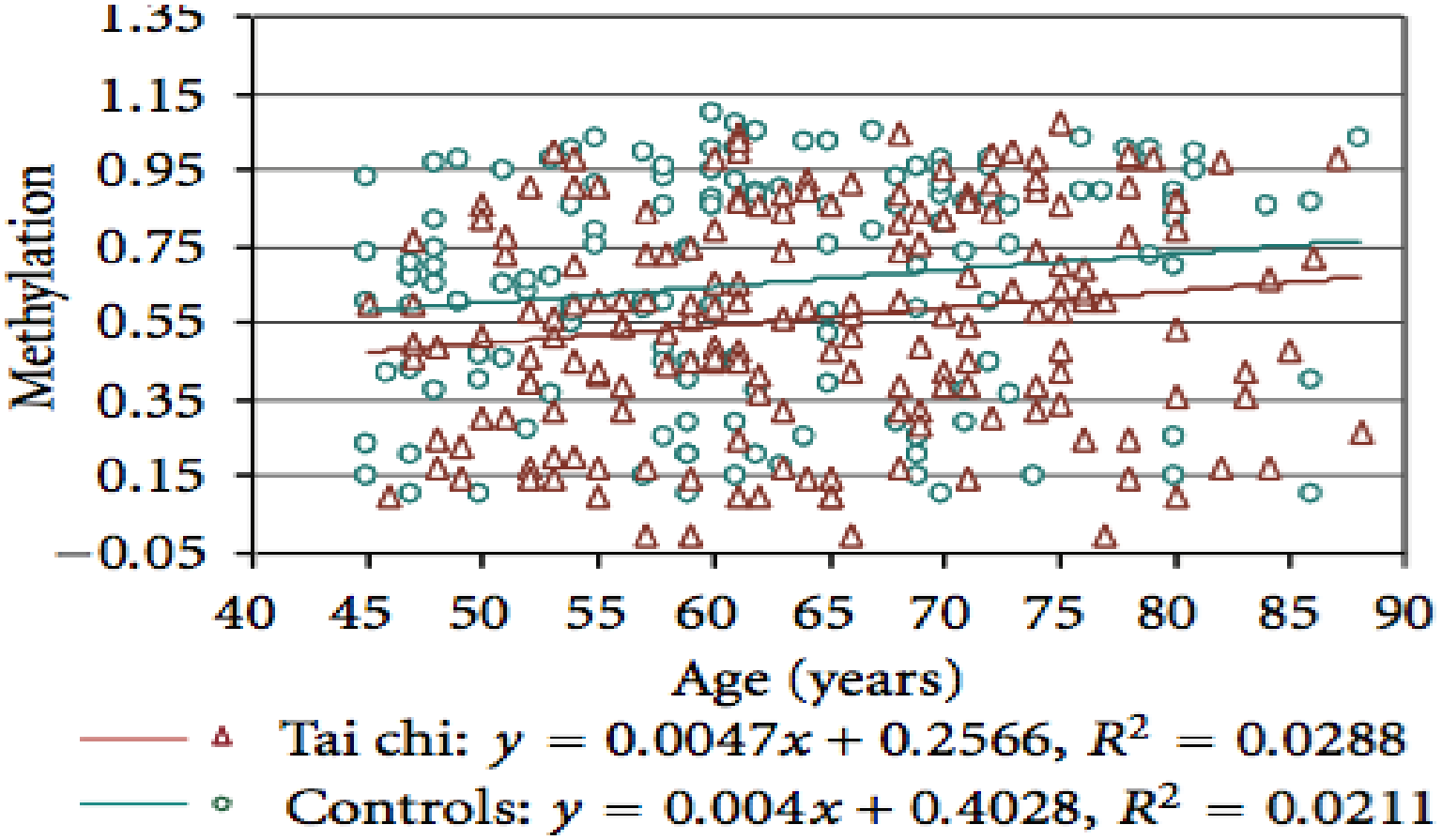
Praticare Tai Chi modifica il DNA

Dott.ssa Erika Ferrari

Research Article

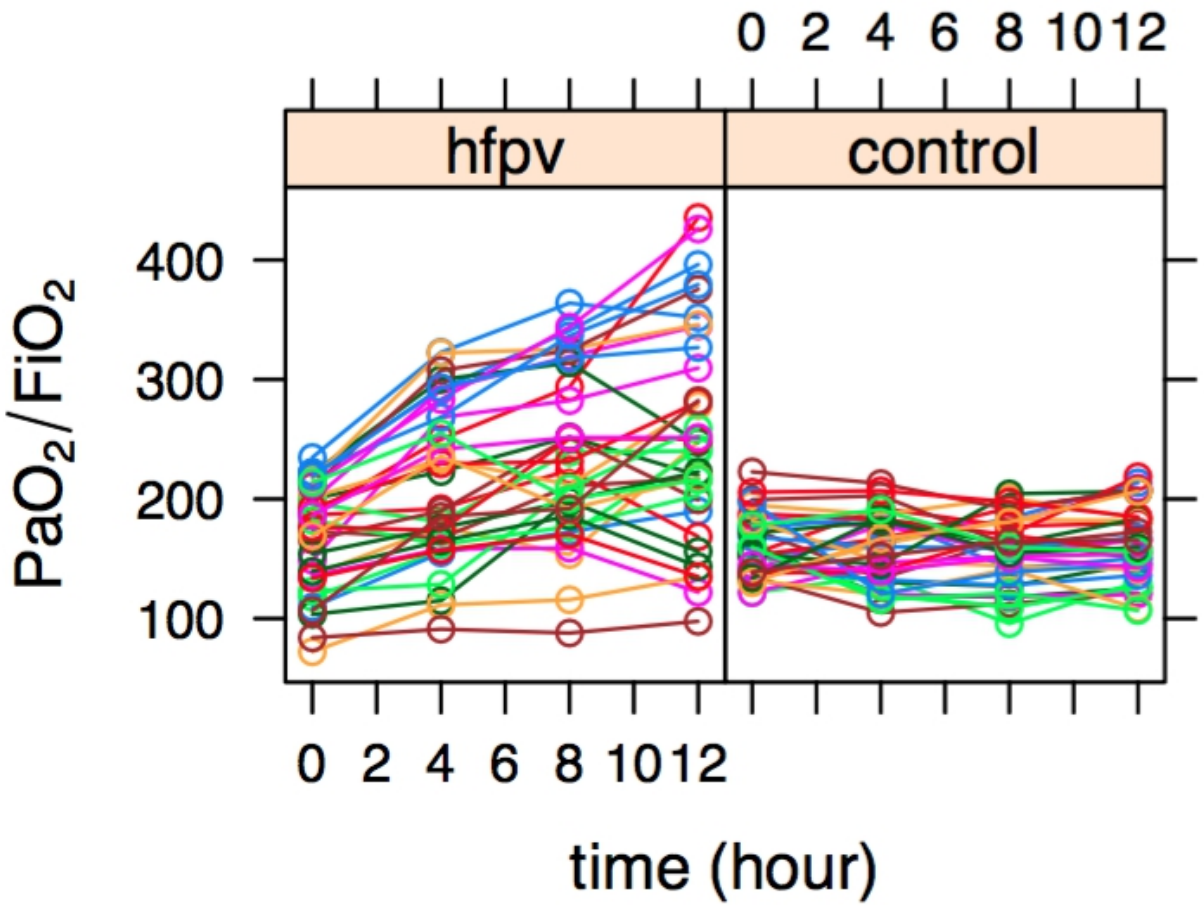
Epigenetic Changes in Response to Tai Chi Practice: A Pilot Investigation of DNA Methylation Marks

Hua Ren,[1] Veronica Collins,[2] Sandy J. Clarke,[3] Jin-Song Han,[4] Paul Lam,[5] Fiona Clay,[1] Lara M. Williamson,[1] and K. H. Andy Choo[1,6]



Early Short-Term Application of High-Frequency Percussive Ventilation Improves Gas Exchange in Hypoxemic Patients

Umberto Lucangelo[b] Walter A. Zin[a] Luca Fontanesi[b] Vittorio Antonaglia[b] Alberto Peratoner[b] Massimo Ferluga[b] Emanuele Marras[b] Massimo Borelli[c] Matteo Ciccolini[b] Giorgio Berlot[b]



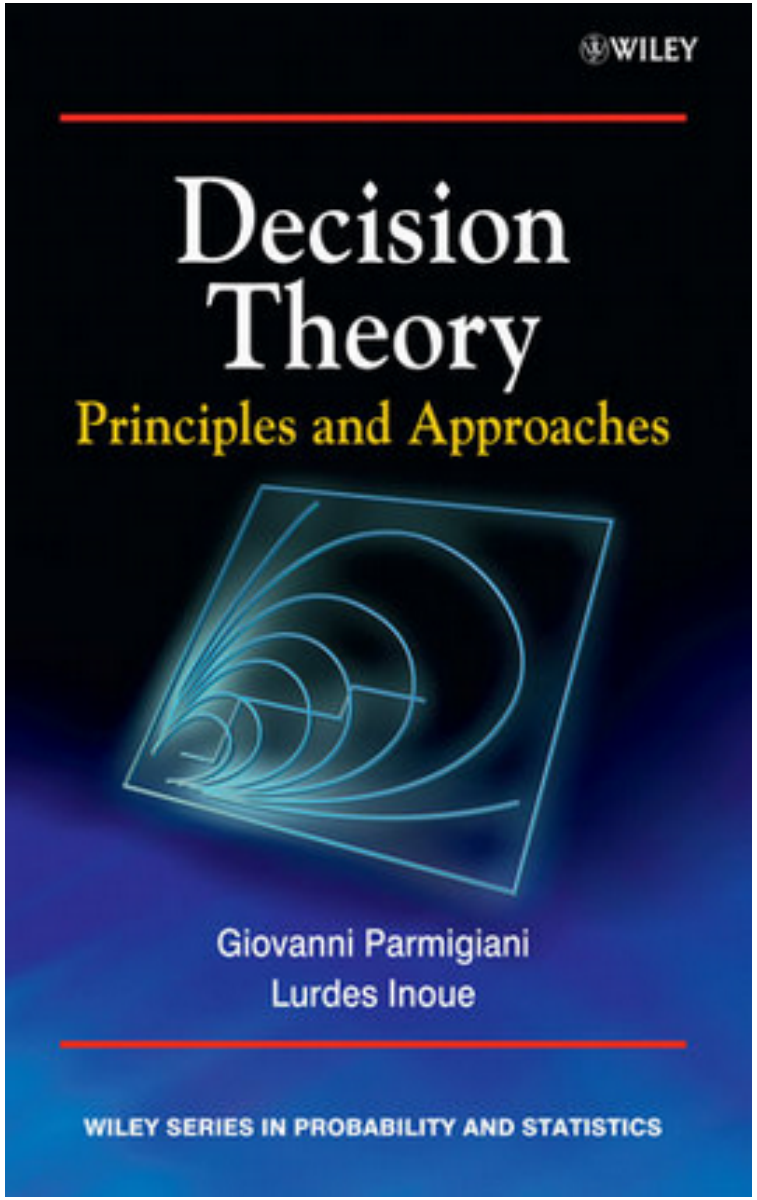
Modelli di regressione nella ricerca clinica

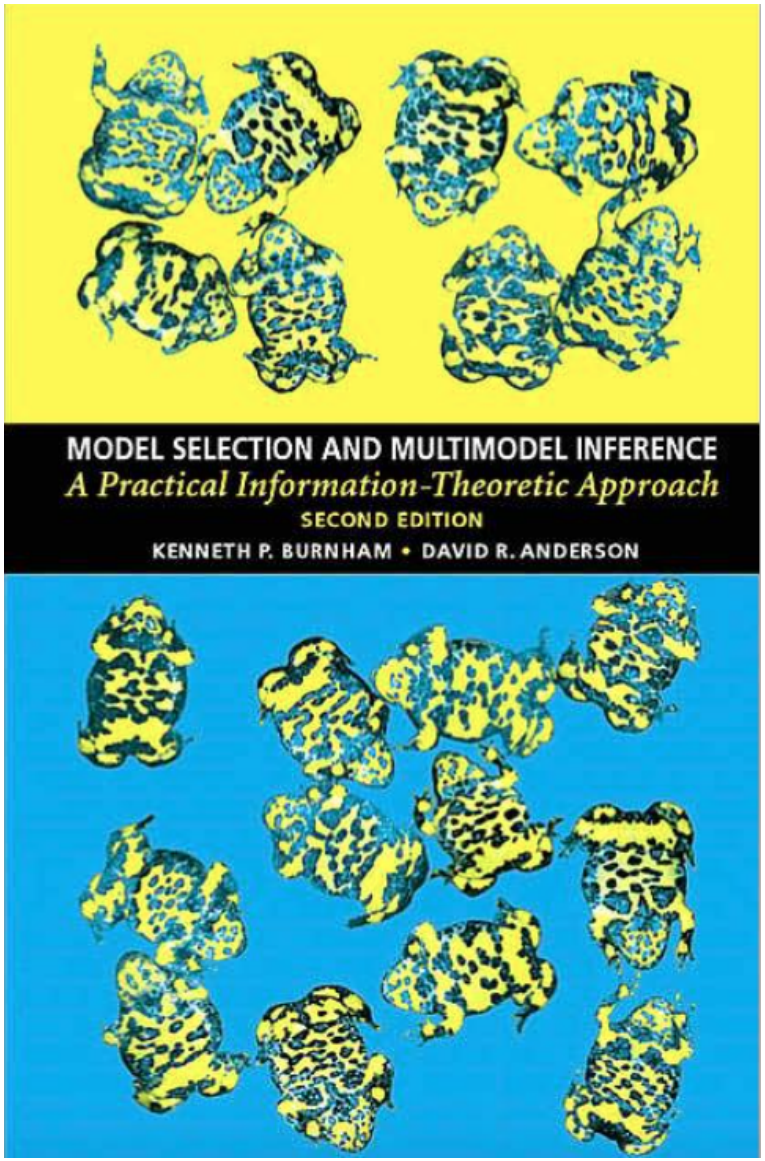
Massimo Borelli, Ph.D.

14 gennaio 2016

Dipartimento di
Scienze Mediche,
Chirurgiche e della Salute

SOCIETA' DEI MATEMATICI
E NATURALISTI DI MODENA
www.socnatmatmo.unimore.it


WILEY
Decision Theory
Principles and Approaches
Giovanni Parmigiani
Lurdes Inoue
WILEY SERIES IN PROBABILITY AND STATISTICS


MODEL SELECTION AND MULTIMODEL INFERENCE
A Practical Information-Theoretic Approach
SECOND EDITION
KENNETH P. BURNHAM • DAVID R. ANDERSON

un paradosso

American Heart Journal

An Obesity Paradox in Acute Heart Failure: Analysis of Body Mass Index and Inhospital Mortality for 108927 Patients in the Acute Decompensated Heart Failure National Registry

Gregg C. Fonarow, MD; Preethi Srikanthan, MD; Maria Rosa Costanzo, MD; Guillermo B. Cintron, MD; Margarita

Horwich TB, Fonarow GC, Hamilton MA, et al. The relationship between obesity and mortality in patients with heart failure. J Am Coll Cardiol. 2001;38:789-795

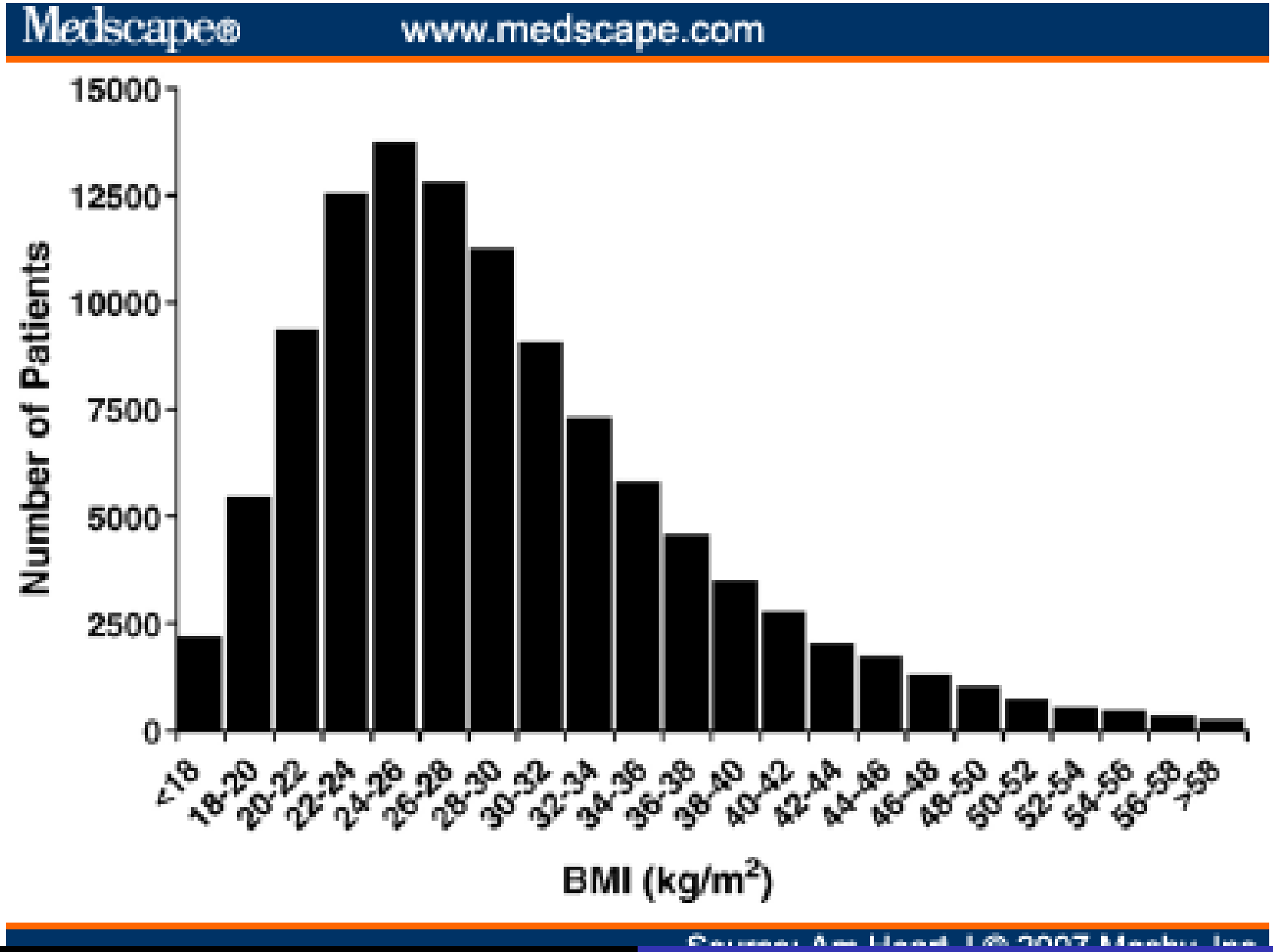
Lavie CJ, Osman AF, Milani RV, et al. Body composition and prognosis in chronic systolic heart failure: the obesity paradox. Am J Cardiol. 2003;91:891-894

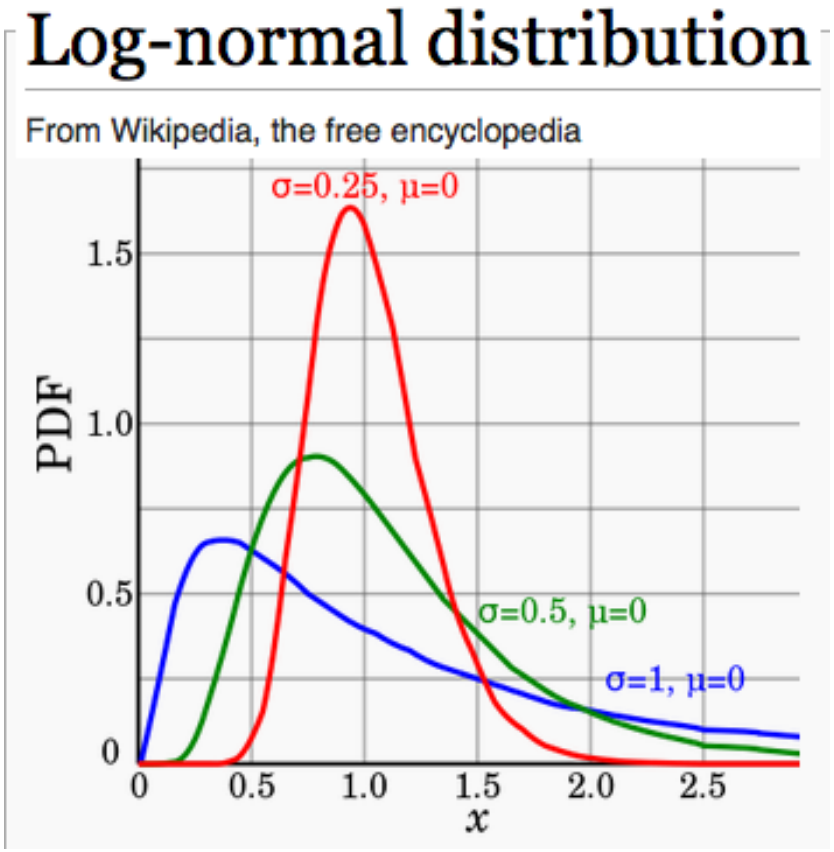
Lissin LW, Gauri AJ, Froelicher VF, et al. The prognostic value of body mass index and standard exercise testing in male veterans with congestive heart failure. J Card Fail. 2002;8:206-215

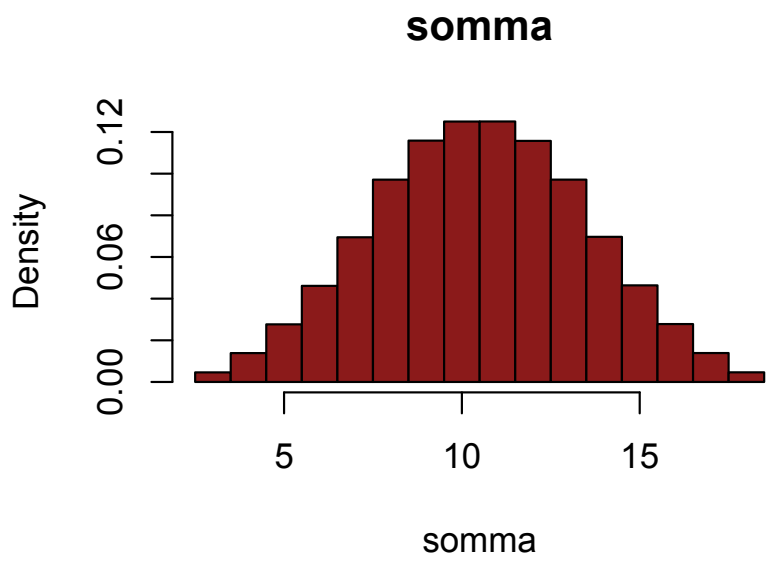
Davos CH, Doehner W, Rauchhaus M, et al. Body mass and survival in patients with chronic heart failure without cachexia: the importance of obesity. J Card Fail. 2003;9:29-35

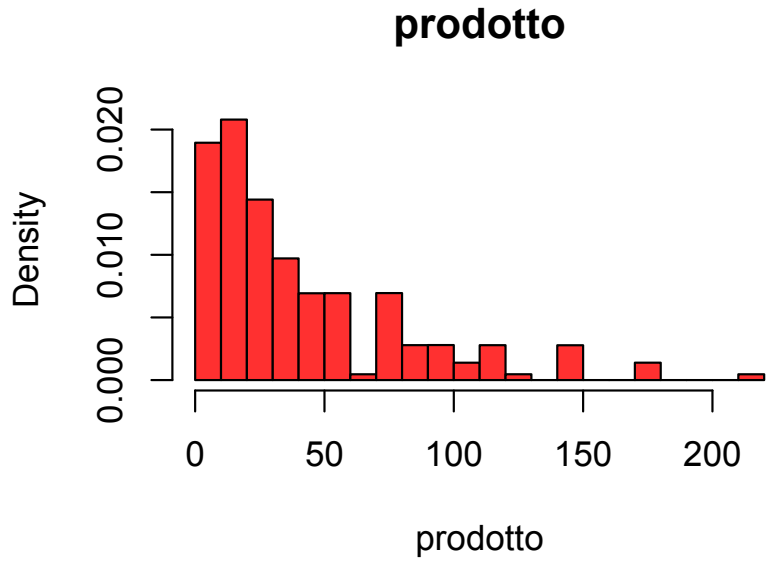
Curtis JP, Selter JG, Wang Y, et al. The obesity paradox: body mass index and outcomes in patients with heart failure. Arch Intern Med. 2005;165:55-61

una distribuzione non normale




Log-normal distribution
From Wikipedia, the free encyclopedia
σ=0.25, μ=0
σ=0.5, μ=0
σ=1, μ=0
PDF
1.5
1.0
0.5
0
0
0.5
1.0
1.5
2.0
2.5
x


somma
Density
0.00
0.06
0.12
5
10
15
somma


prodotto
Density
0.000
0.010
0.020
0
50
100
150
200
prodotto

la distribuzione log-normale

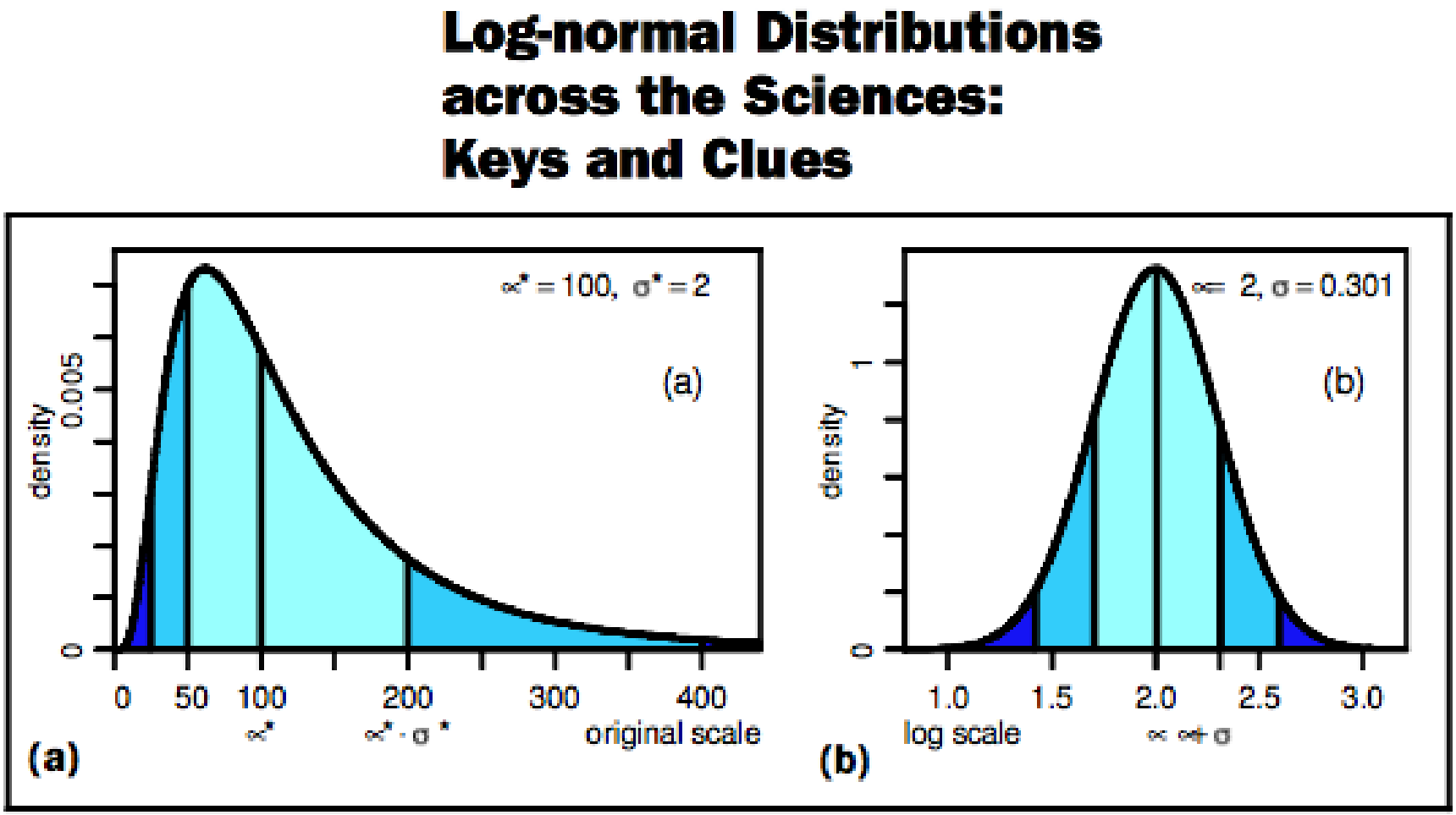


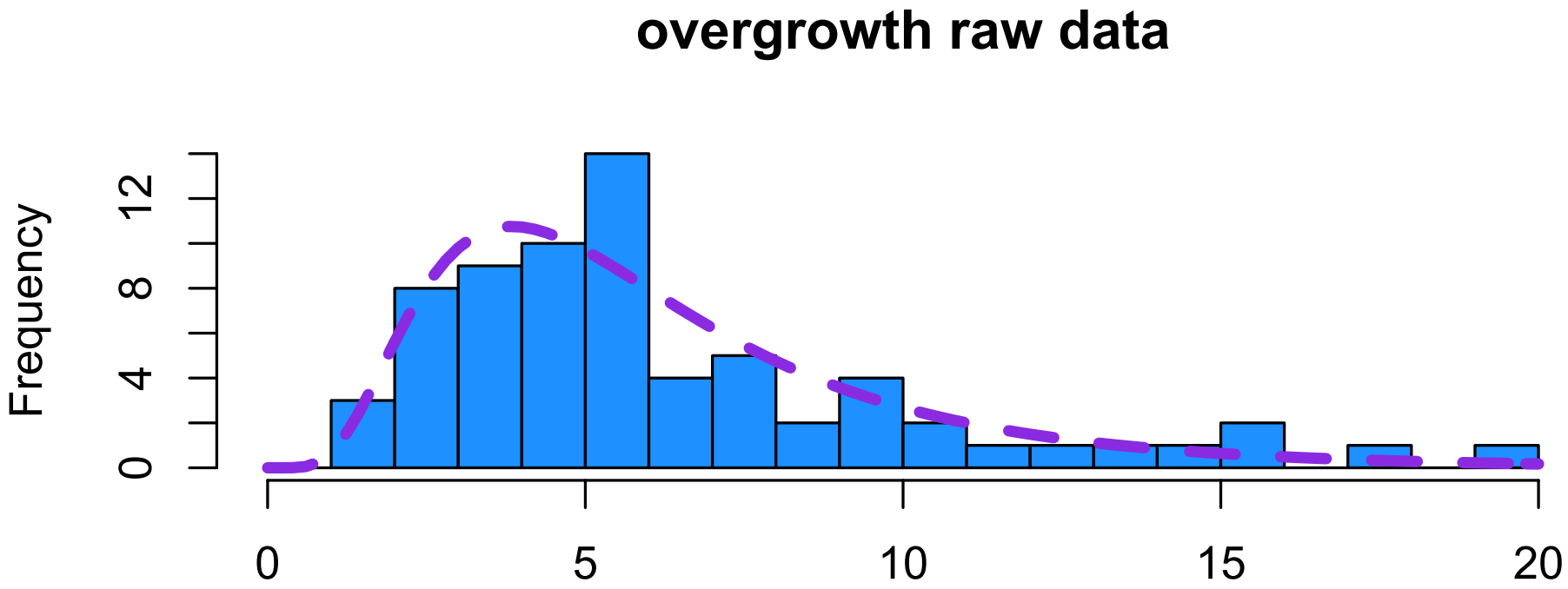
Figure 3. A log-normal distribution with original scale (a) and with logarithmic scale (b). Areas under the curve, from the median to both sides, correspond to one and two standard deviation ranges of the normal distribution.

un esempio, qui a Trieste

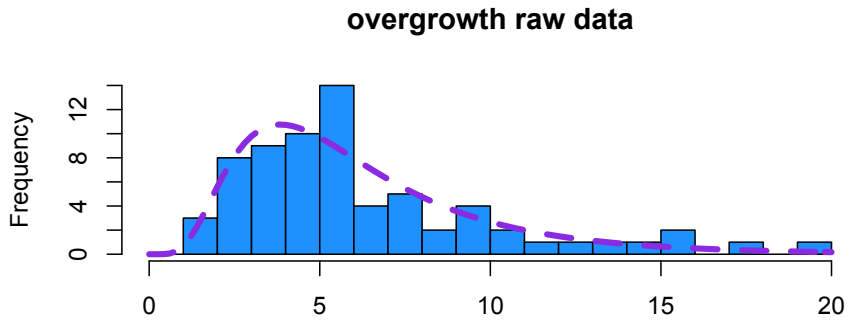
Quintessence Int. 2013 Mar;44(3):249-60. doi: 10.3290/j.qi.a29052.

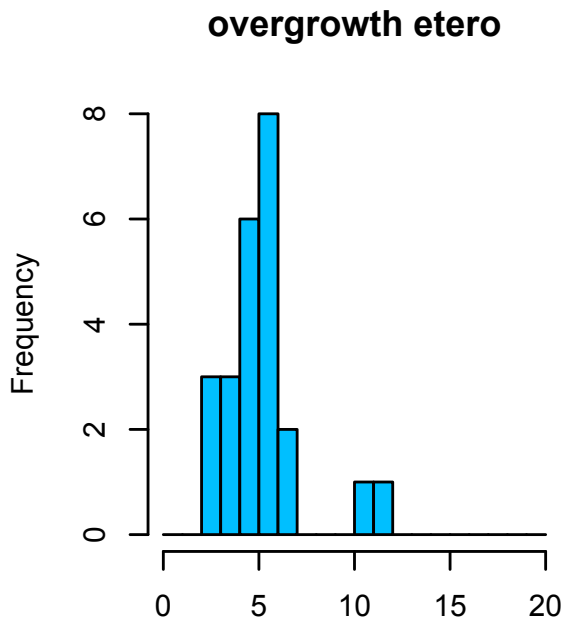
Effect of periodontal therapy on the course of cyclosporin-induced gingival overgrowth: role of ABCB1 and PAI-1 gene polymorphisms.

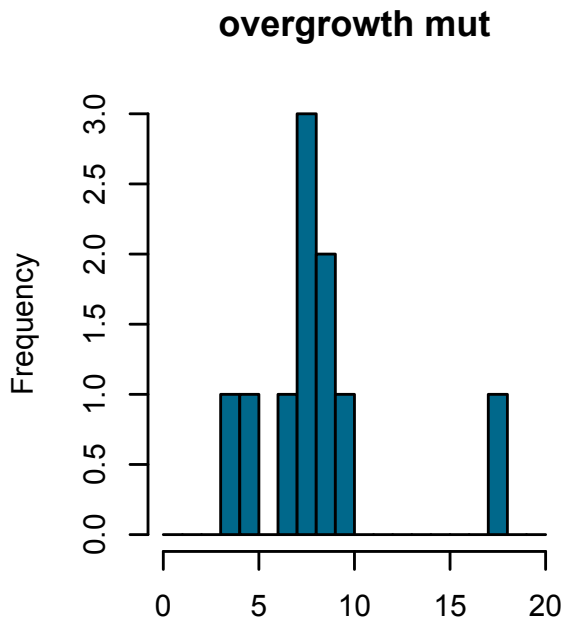
De Iudicibus S[1], Stocco G, Castronovo G, Pico C, Racano R, Borelli M, Bevilacqua L, Di Lenarda R, Bartoli F, Decorti G.

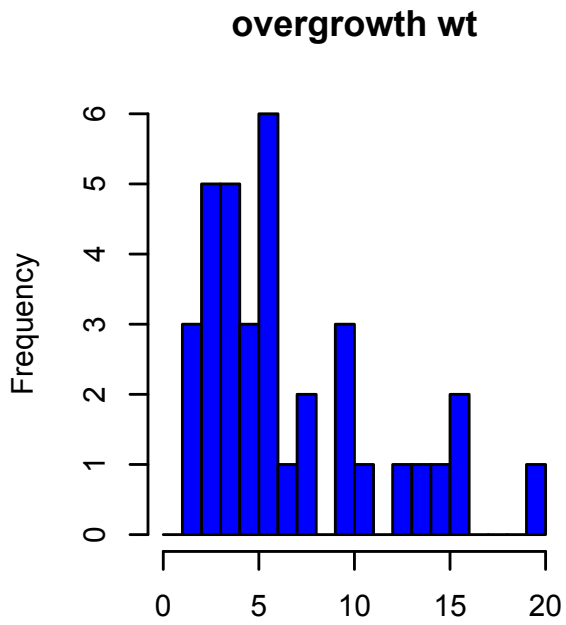


un esempio, qui a Trieste

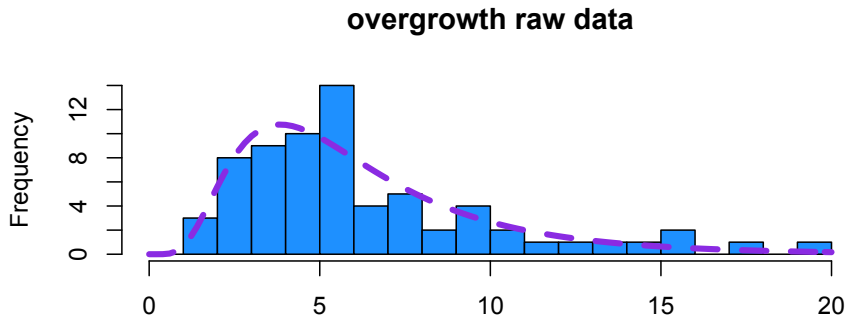


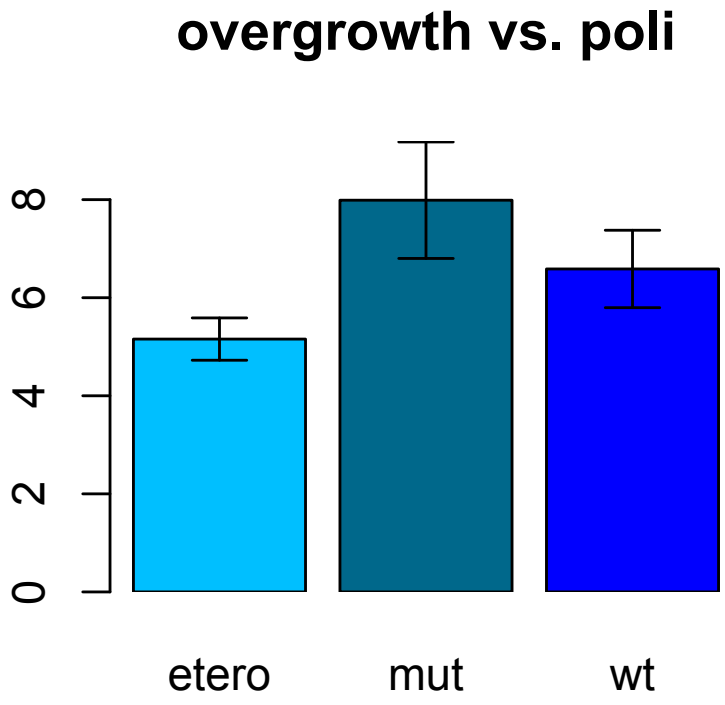


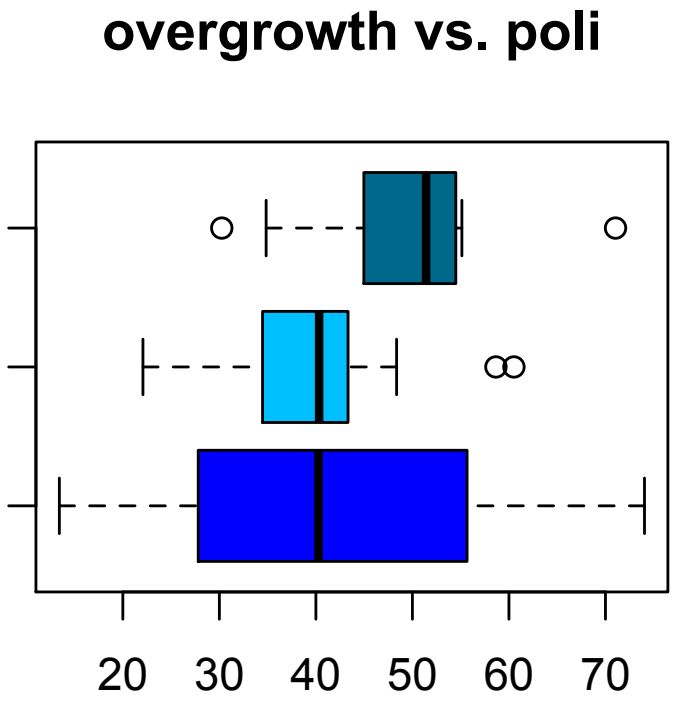


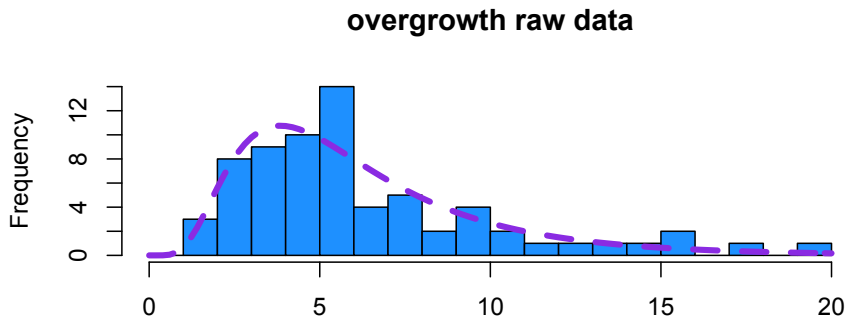


passiamo ai logaritmi

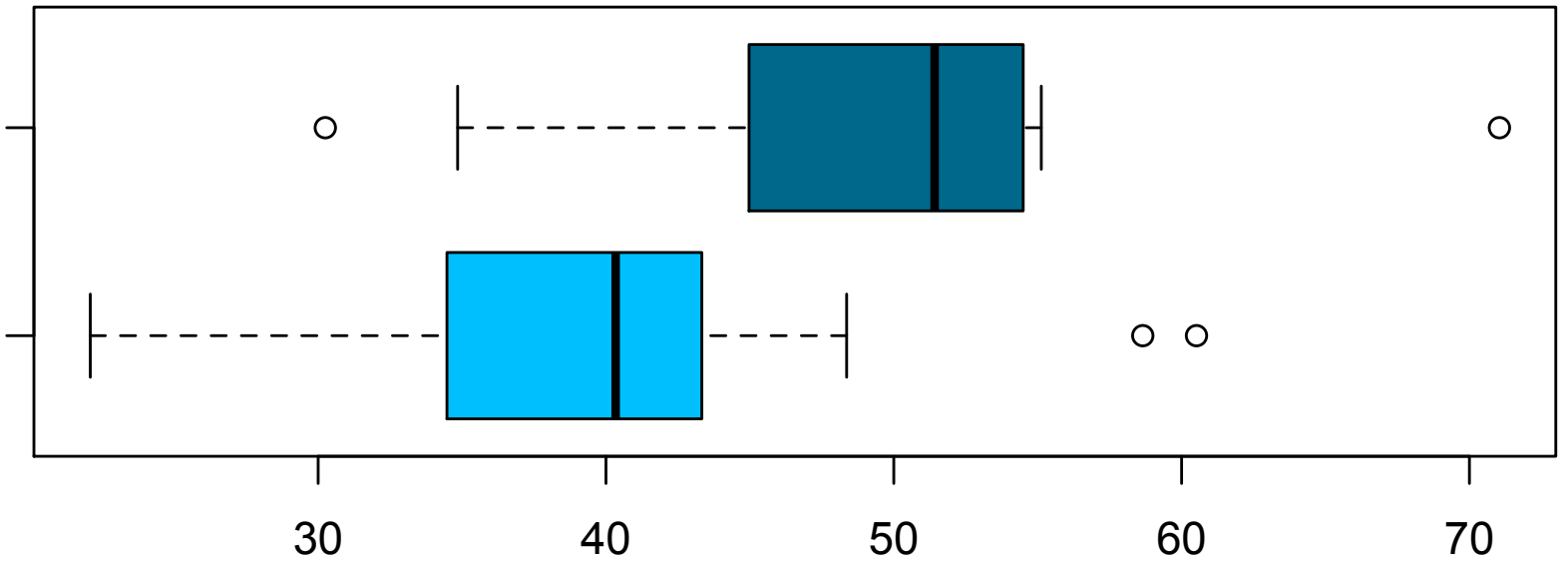








p-value = 0.04



●●●○○ I WIND 21:07 26%

anova vassar

Google

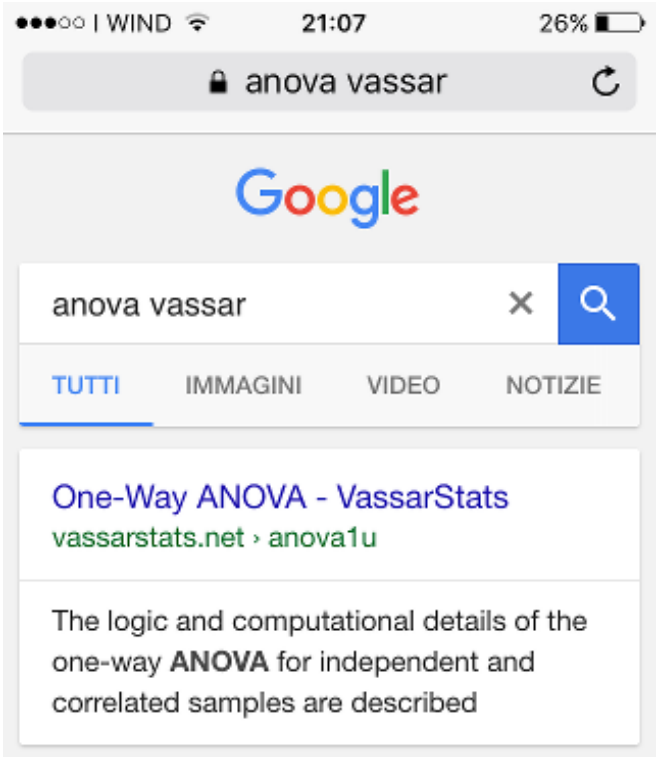
anova vassar

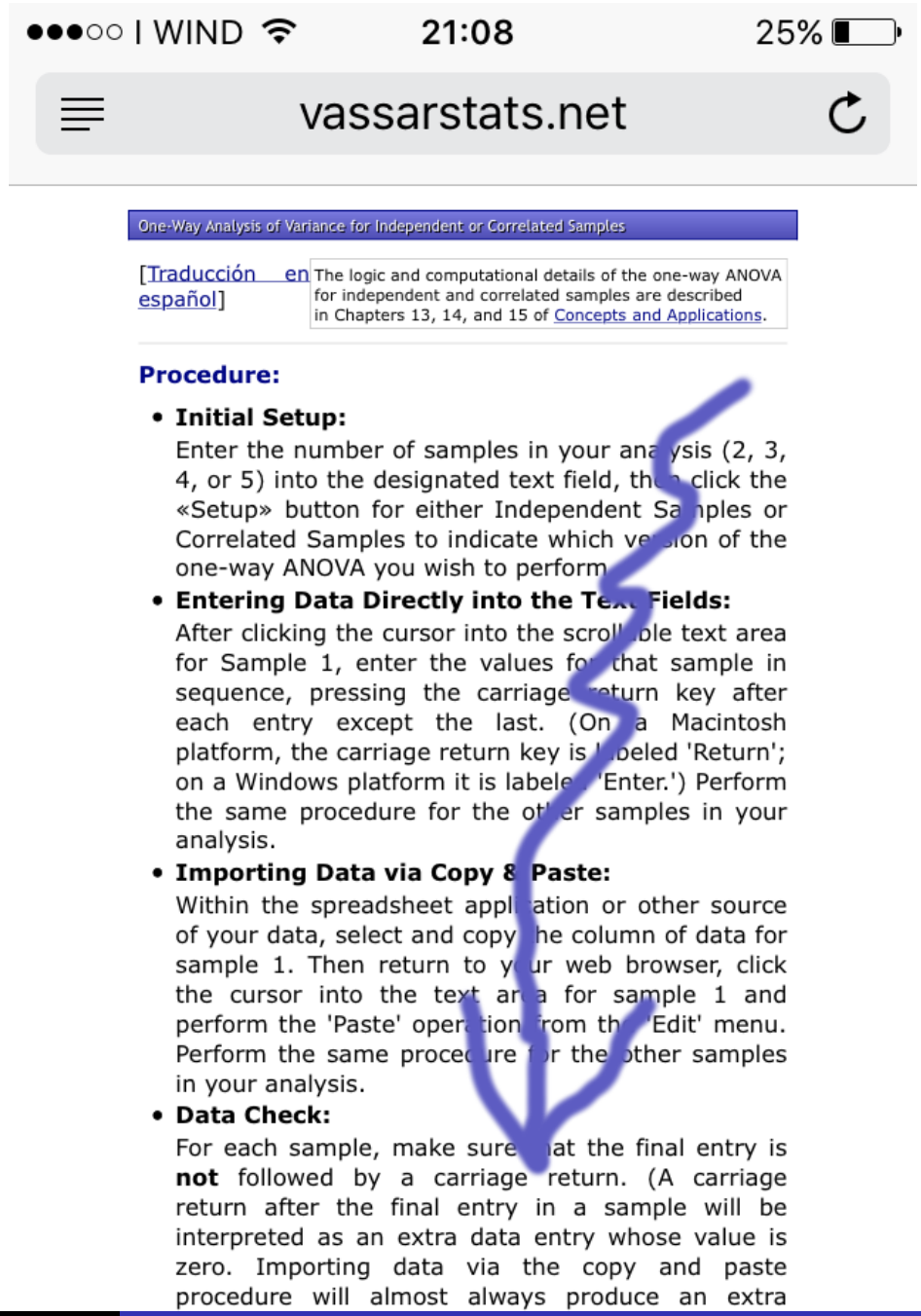
TUTTI IMMAGINI VIDEO NOTIZIE

One-Way ANOVA - VassarStats

vassarstats.net › anova1u

The logic and computational details of the one-way **ANOVA** for independent and correlated samples are described


●●●○○ I WIND 21:07 26%
anova vassar
Google
anova vassar
TUTTI
IMMAGINI
VIDEO
NOTIZIE
One-Way ANOVA - VassarStats
vassarstats.net › anova1u
The logic and computational details of the one-way ANOVA for independent and correlated samples are described


●●●○○ I WIND 21:08 25%
vassarstats.net
One-Way Analysis of Variance for Independent or Correlated Samples
[Traducción en español]
The logic and computational details of the one-way ANOVA for independent and correlated samples are described in Chapters 13, 14, and 15 of Concepts and Applications.
Procedure:
Initial Setup:
Enter the number of samples in your analysis (2, 3, 4, or 5) into the designated text field, then click the «Setup» button for either Independent Samples or Correlated Samples to indicate which version of the one-way ANOVA you wish to perform.
Entering Data Directly into the Text Fields:
After clicking the cursor into the scrollable text area for Sample 1, enter the values for that sample in sequence, pressing the carriage return key after each entry except the last. (On a Macintosh platform, the carriage return key is labeled 'Return'; on a Windows platform it is labeled 'Enter.') Perform the same procedure for the other samples in your analysis.
Importing Data via Copy & Paste:
Within the spreadsheet application or other source of your data, select and copy the column of data for sample 1. Then return to your web browser, click the cursor into the text area for sample 1 and perform the 'Paste' operation from the 'Edit' menu. Perform the same procedure for the other samples in your analysis.
Data Check:
For each sample, make sure that the final entry is not followed by a carriage return. (A carriage return after the final entry in a sample will be interpreted as an extra data entry whose value is zero. Importing data via the copy and paste procedure will almost always produce an extra

Setup

Number of samples in analysis = 2

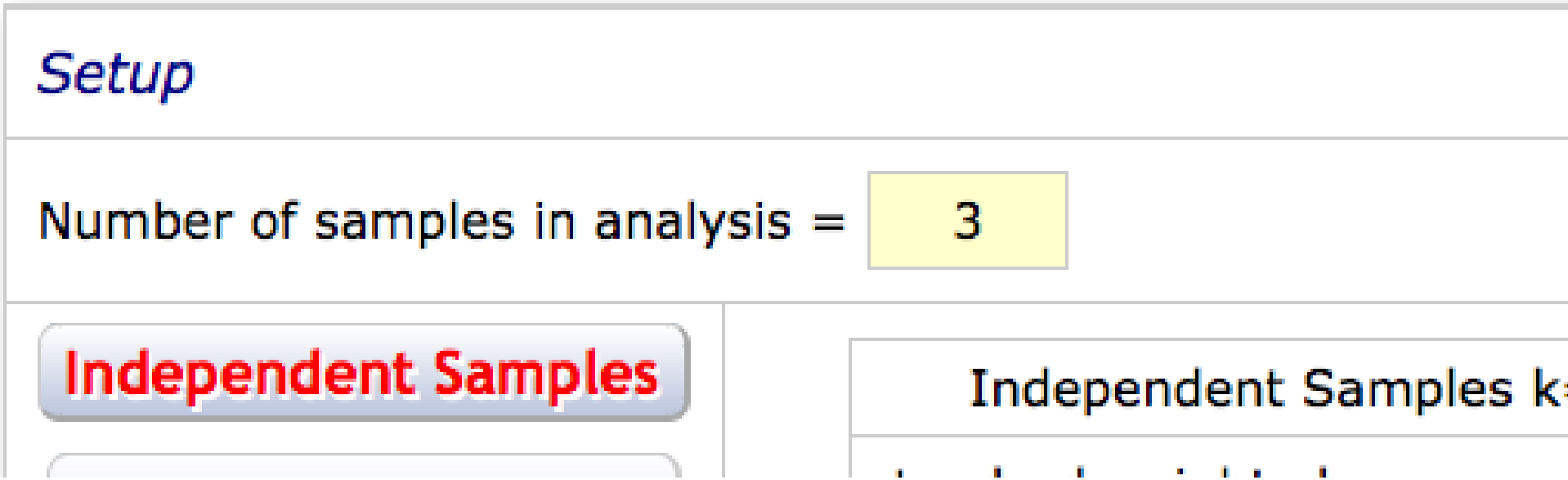
Independent Samples	Independent Samples k=2
Correlated Samples	standard weighted-means analysis
Unweighted	Click this button only if you wish to perfo an unweighted-means analysis. Advice: d not perform an unweighted-means analy unless you have a clear reason for doing
Weighted	Click this button to return to a standard weighted-means analysis

Data Entry

Sample 1	Sample 2
22	30
35	46
35	46
40	51
40	51
40	51
43	54
43	54
60	71

ANOVA Summary Independent Samples k=:

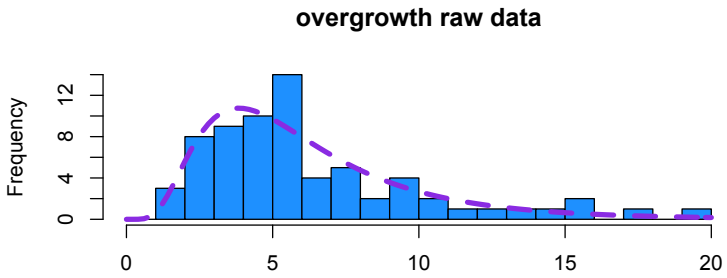
Source	SS	df	MS	F	P
Treatment [between groups]	512	1	512	4.83	0.043036
Error	1697.7778	16	106.1111		

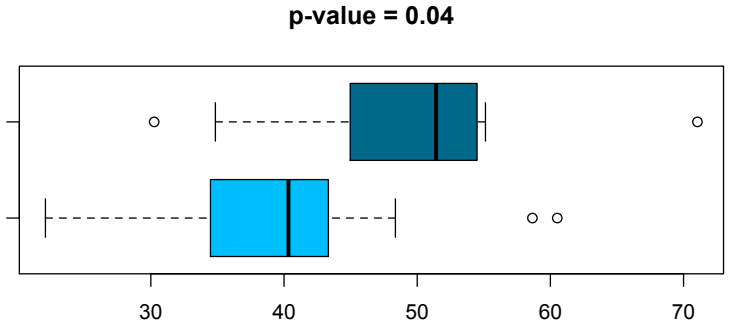

Setup
Number of samples in analysis = 3
Independent Samples
Independent Samples k

22	30	13	
35	46	28	
35	46	28	
40	51	40	
40	51	40	
40	51	40	
43	54	56	
43	54	56	
60	71	74	

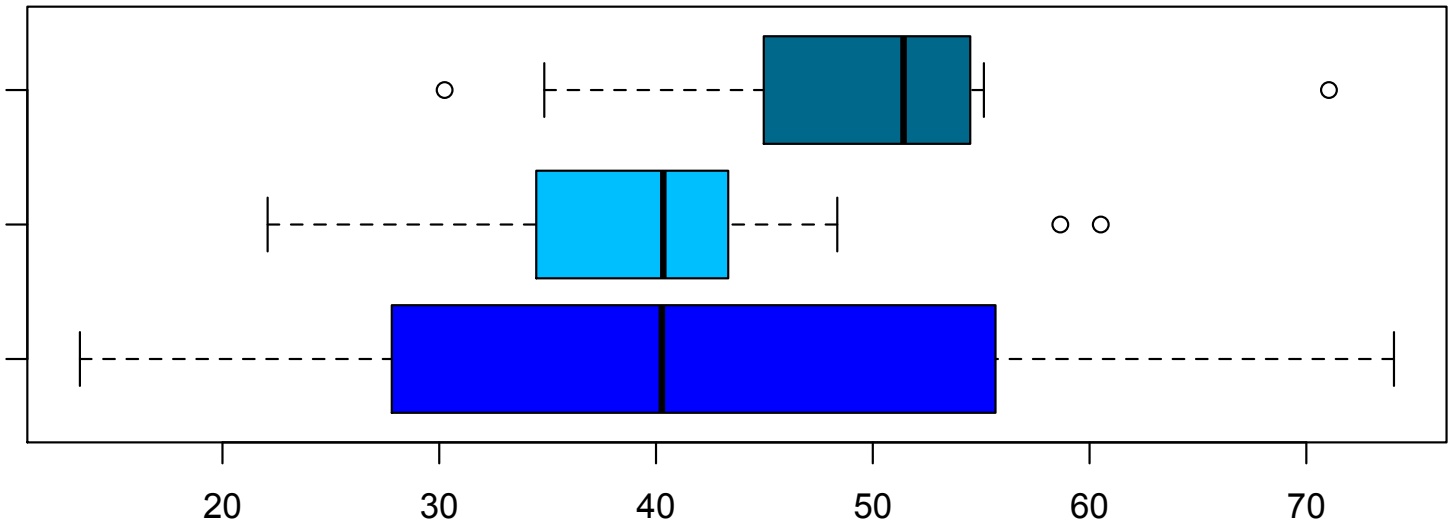
Reset Calculate

una seria difficoltà decisionale



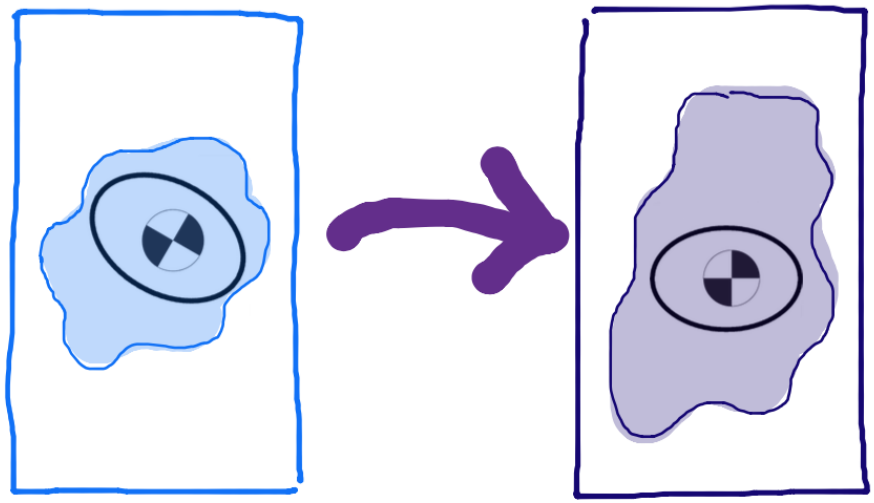


p-value = 0.22



2.2 Statistical Models

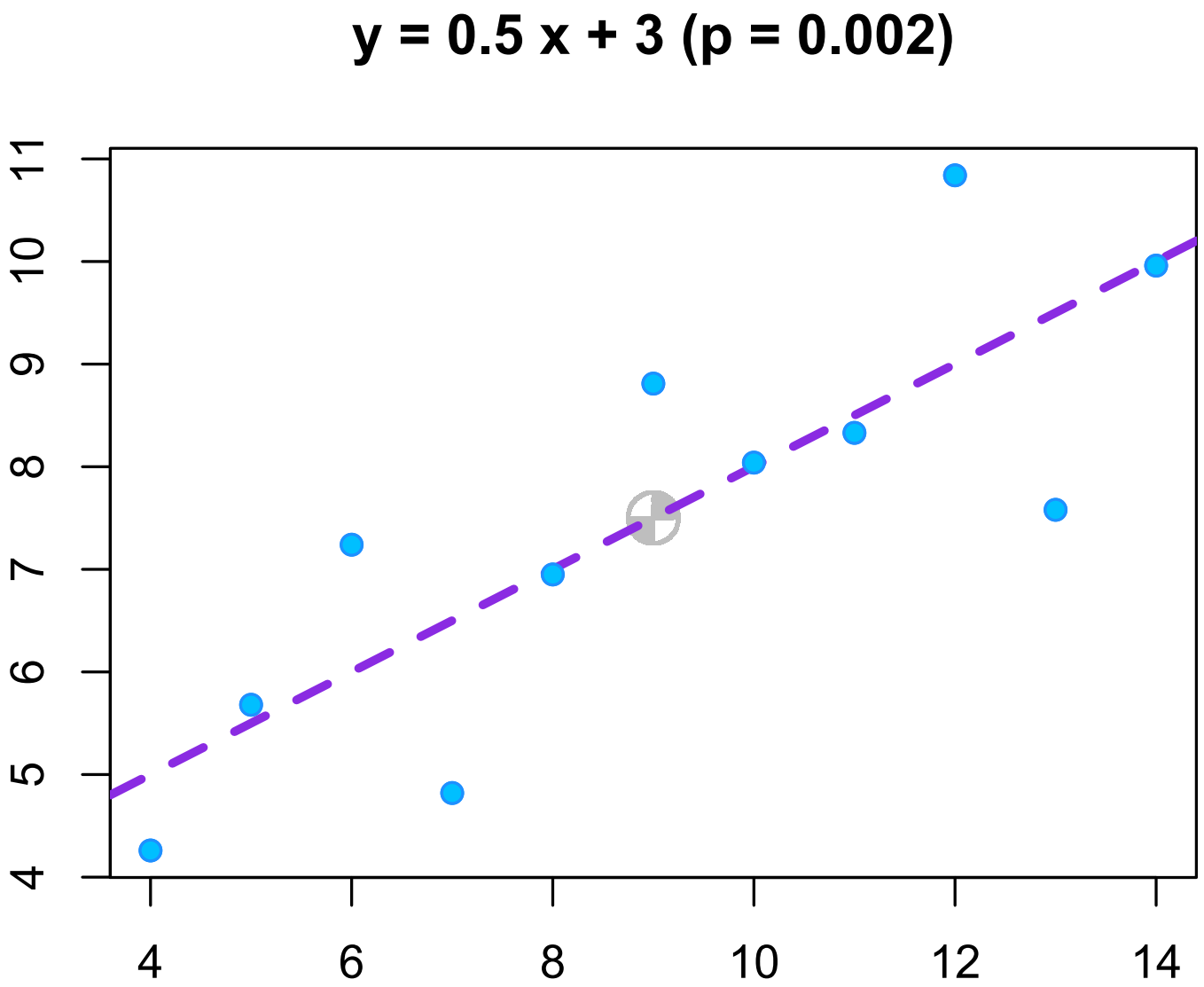
Statistical models are used to describe a sample of data taken from a real or theoretical population. Statistical models can be described using one or more underlying probability distributions. The parameters of the distributions are estimated from the data, and may provide the basis for predicting additional data with the same distributional characteristics of the data being modeled. Models that can be defined in terms of a probability distribution having estimable parameters are called parametric models. We will focus our attention in this text on this type of model.



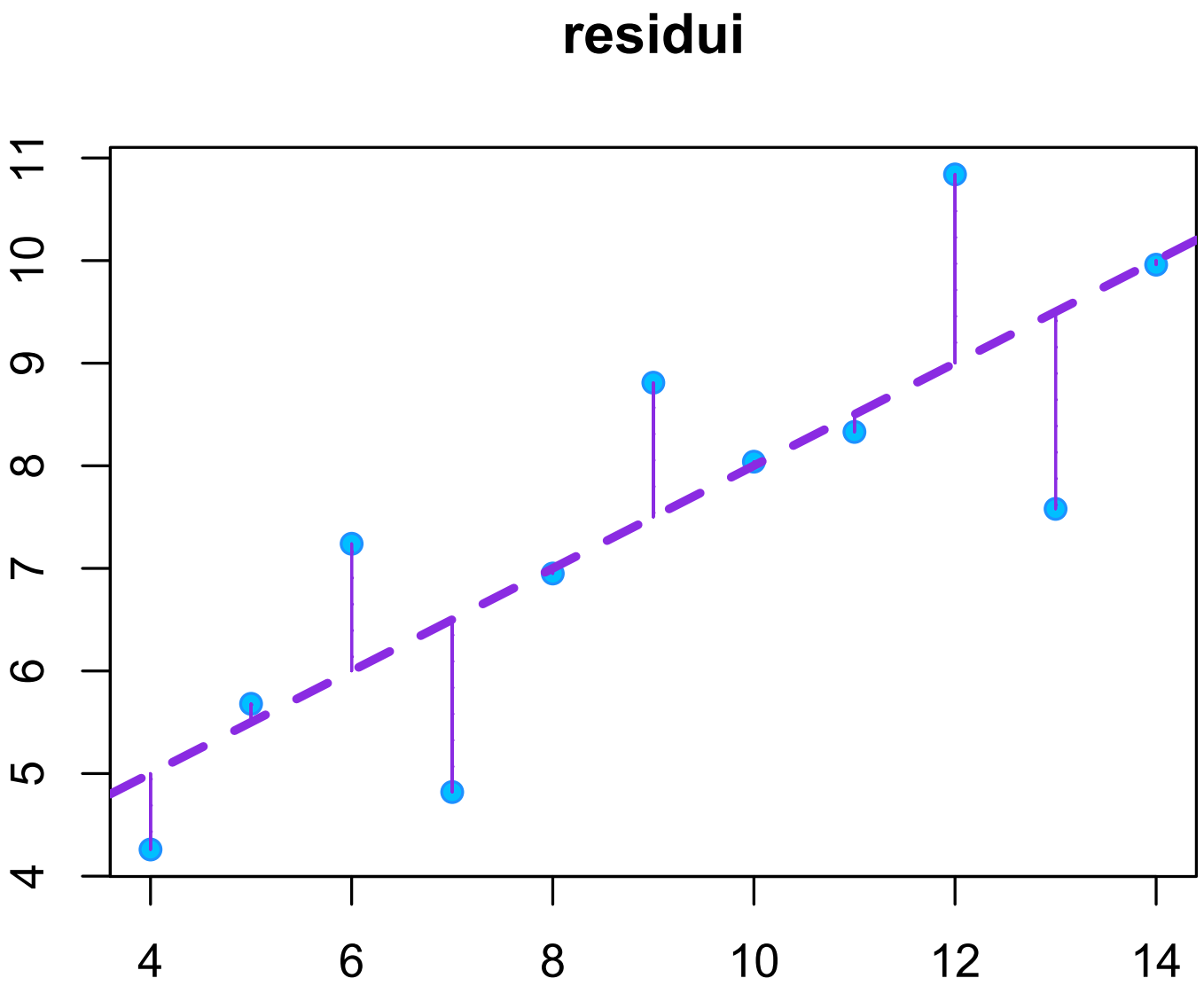

...E TU VORRESTI
FARMI CREDERE
CHE I TEST STATISTICI
NON SERVONO PIU' A NULLA?

Sommario

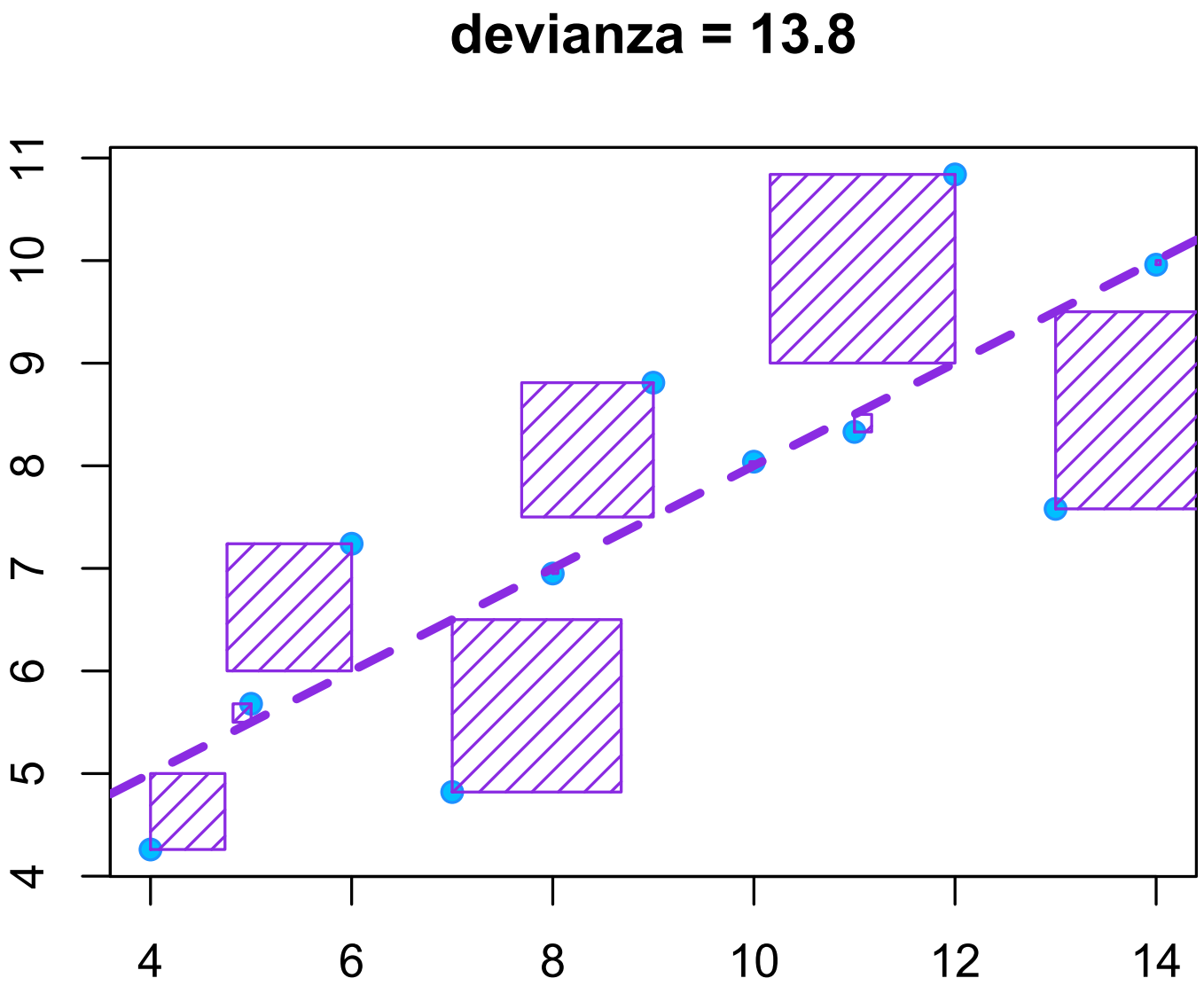
la devianza di un modello



la devianza di un modello



la devianza di un modello

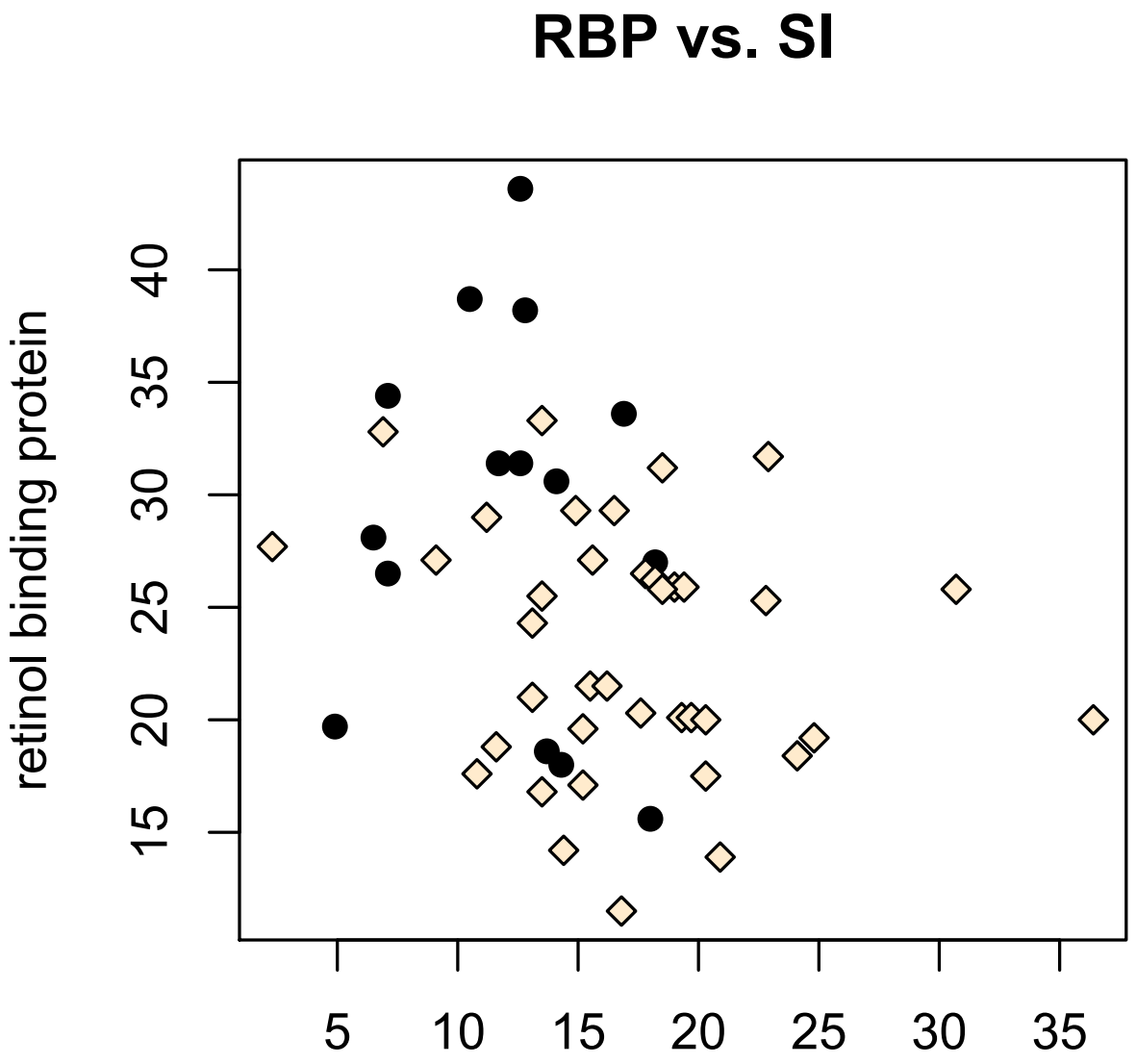


la devianza di un modello

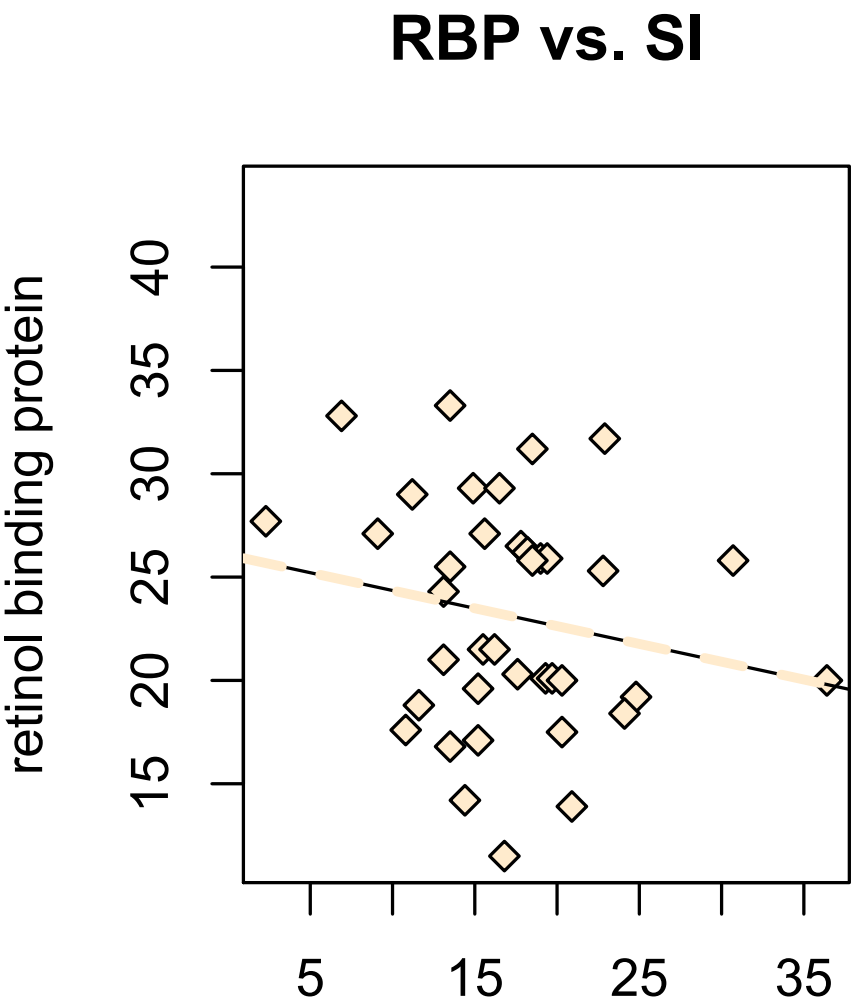
tutte le *misure di nuvolosità*

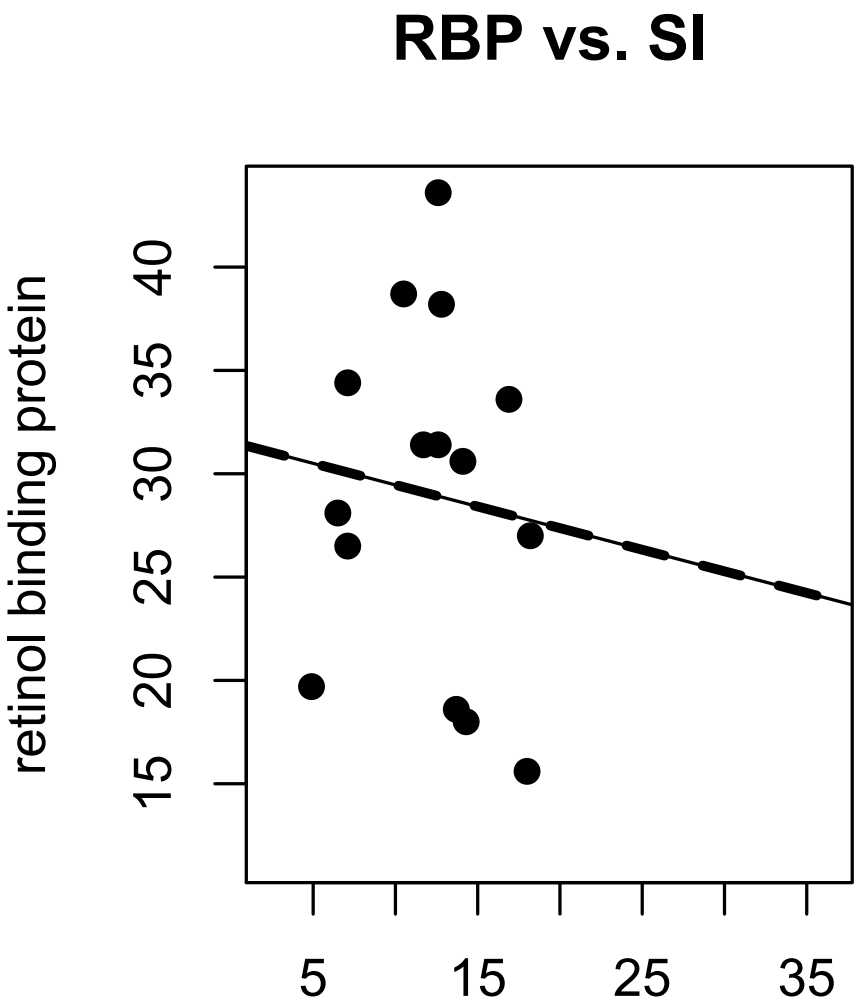
- devianza
- verosimiglianza
  - log-verosimiglianza
- informazione
  - criteri AIC, BIC, ..
  - entropia
  - divergenza
- ...

la devianza permette di selezionare i modelli



il modello massimale

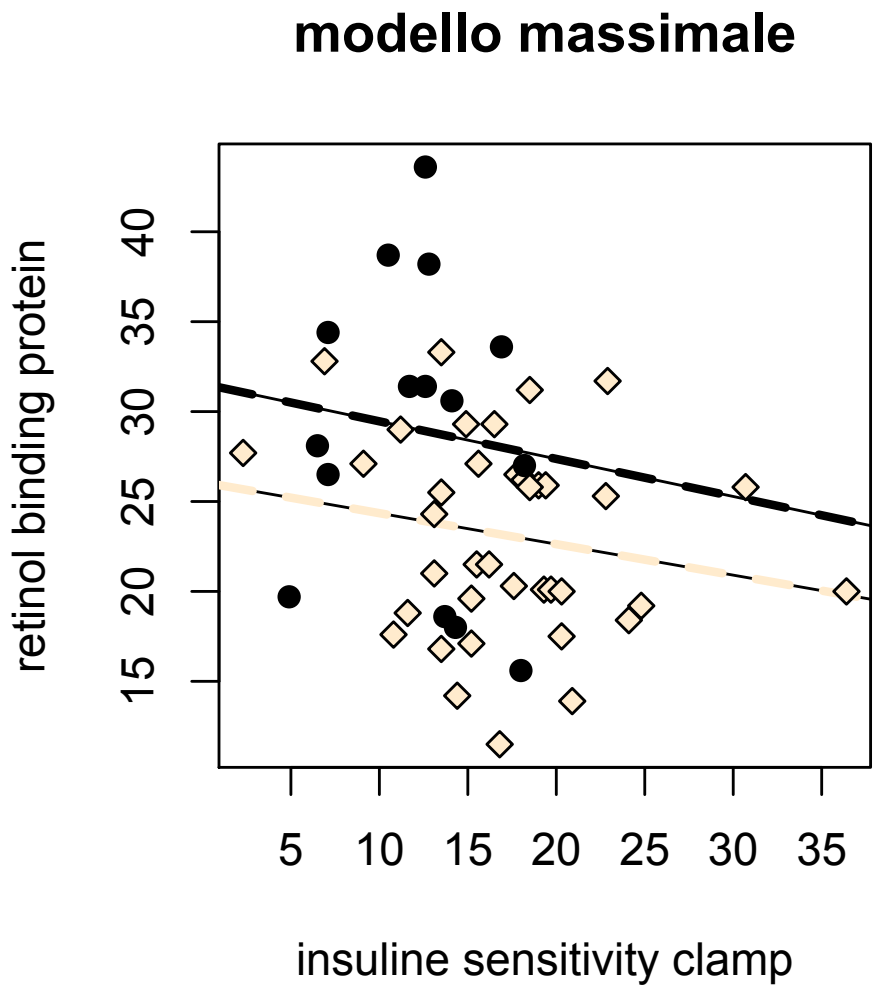




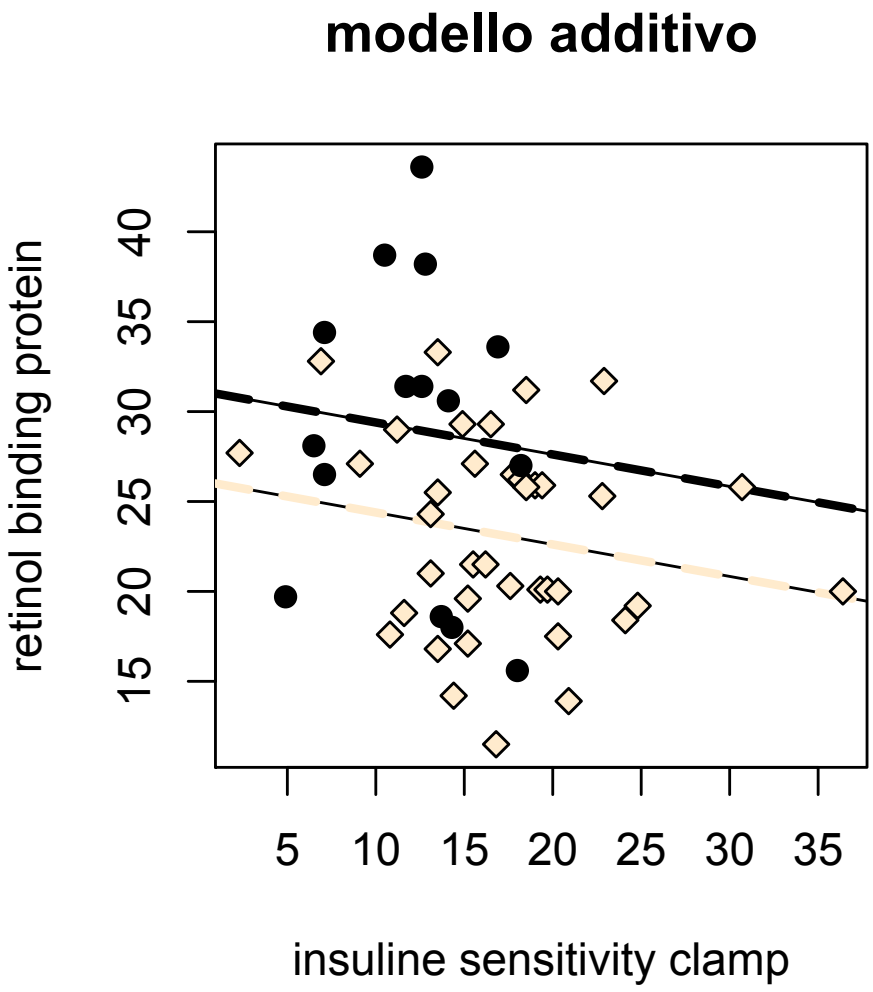
il modello massimale (*Ancova with interaction*)

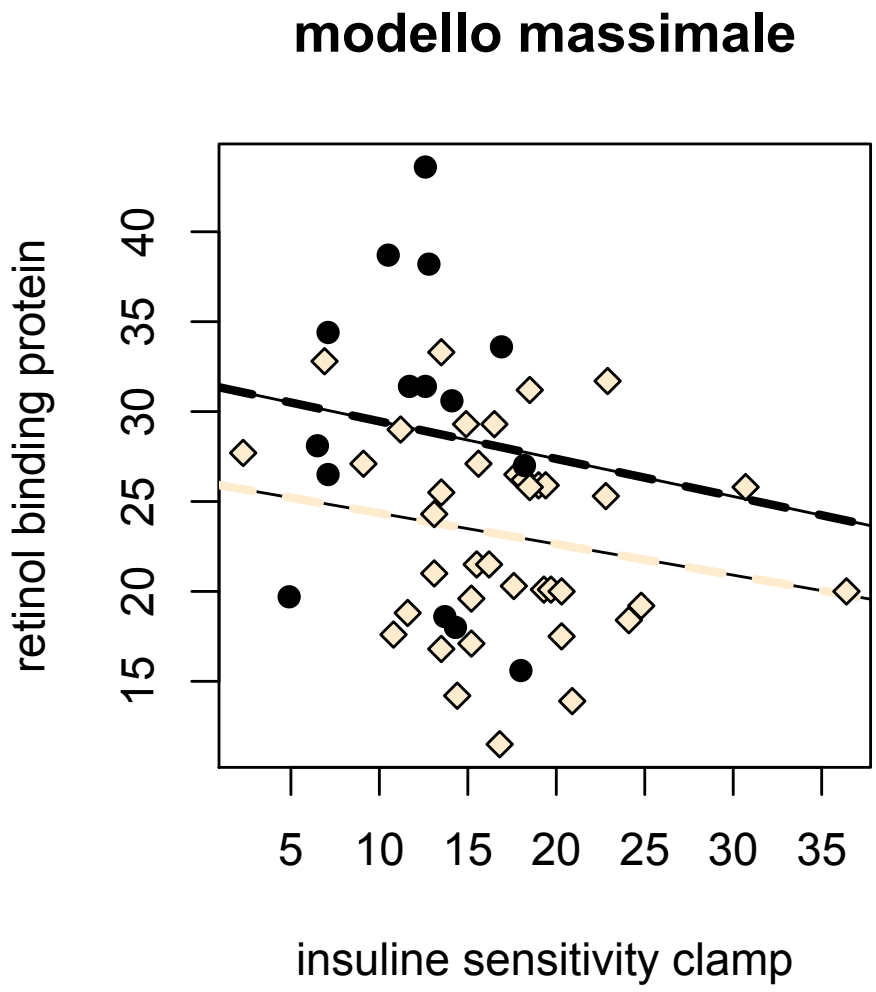
	stima	S.E.	P
q	31.55	5.26	0.00
m	-0.21	0.41	0.62
δq	-5.47	6.12	0.38
δm	0.04	0.45	0.94

devianza = 2035.3

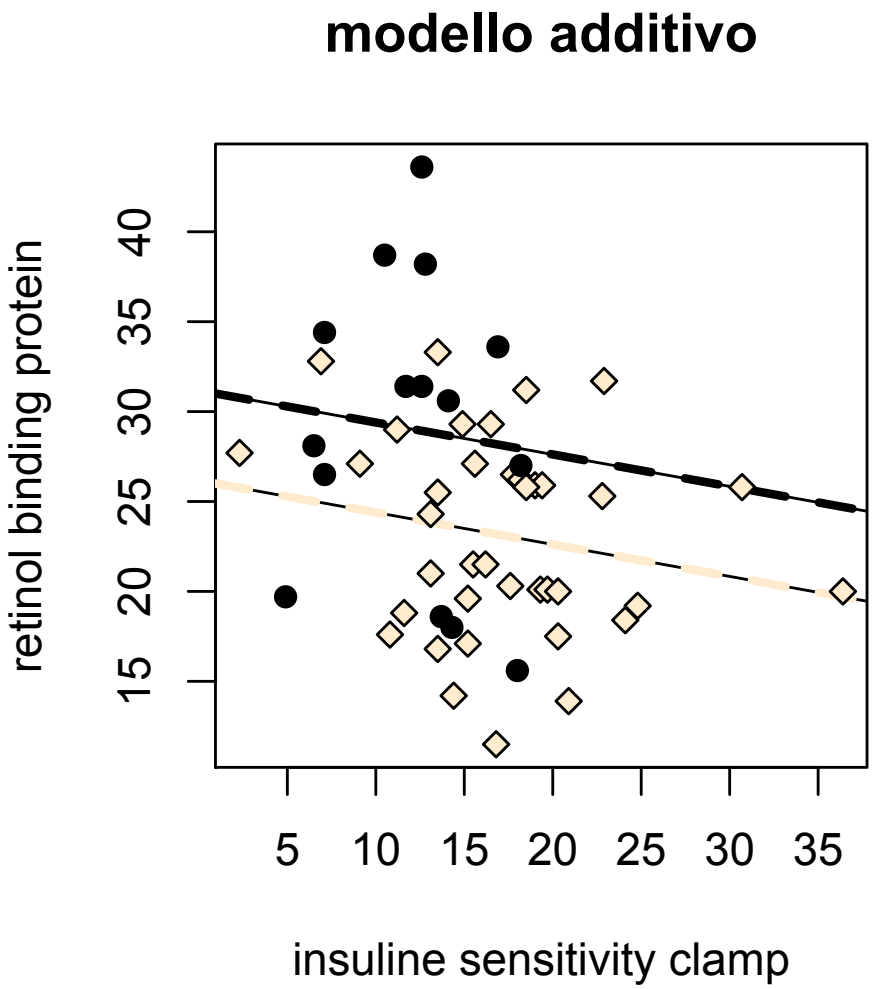


il modello additivo (*Ancova without interaction*)





il modello additivo (*Ancova without interaction*)



	stima	S.E.	P
q	31.17	2.52	0.00
m	-0.18	0.16	0.27
δq	-5.00	2.10	0.02

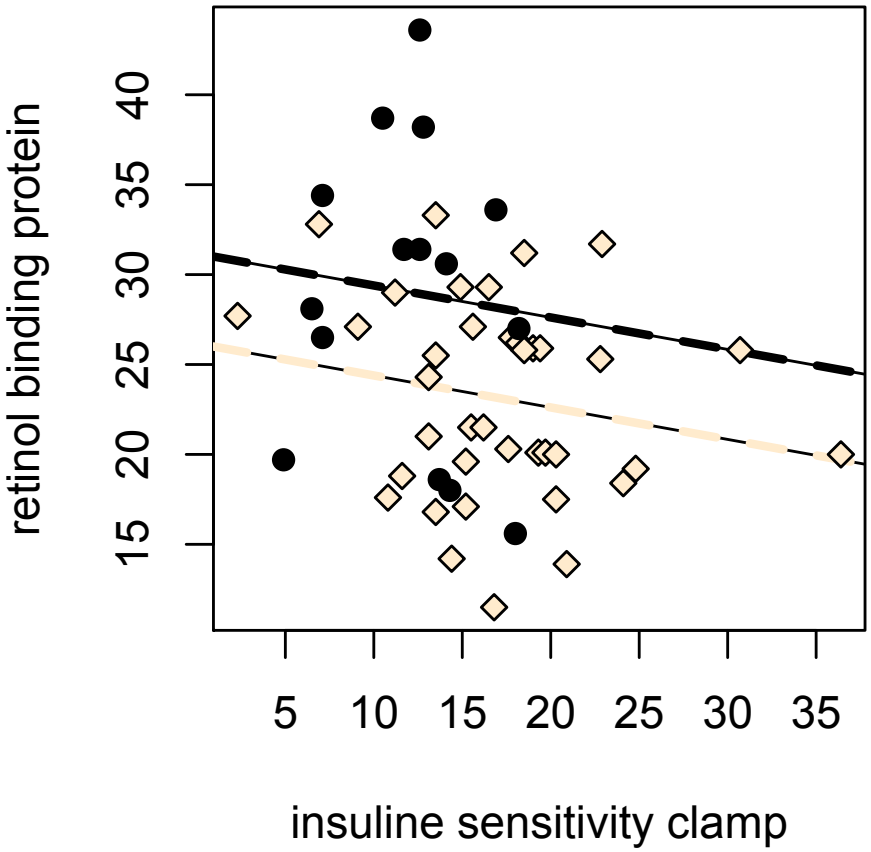
devianza = 2035.5

analisi della devianza

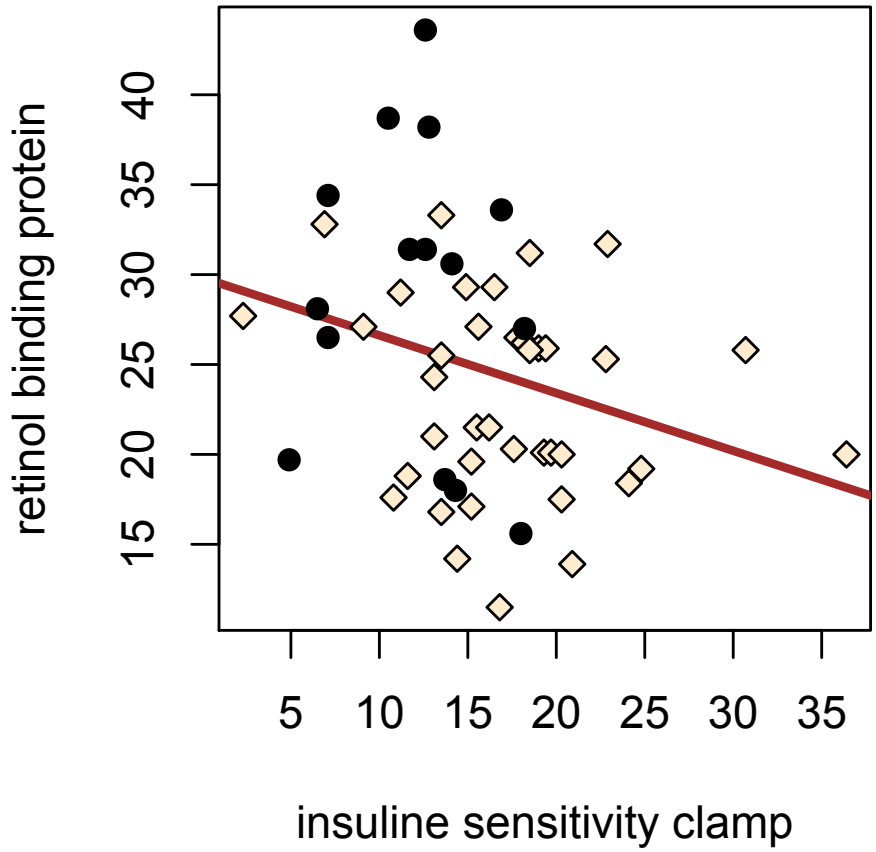
	Res.Df	RSS	Df	P
1	49	2035.3		
2	50	2035.5	-1	0.94

il modello proposto in letteratura

modello additivo

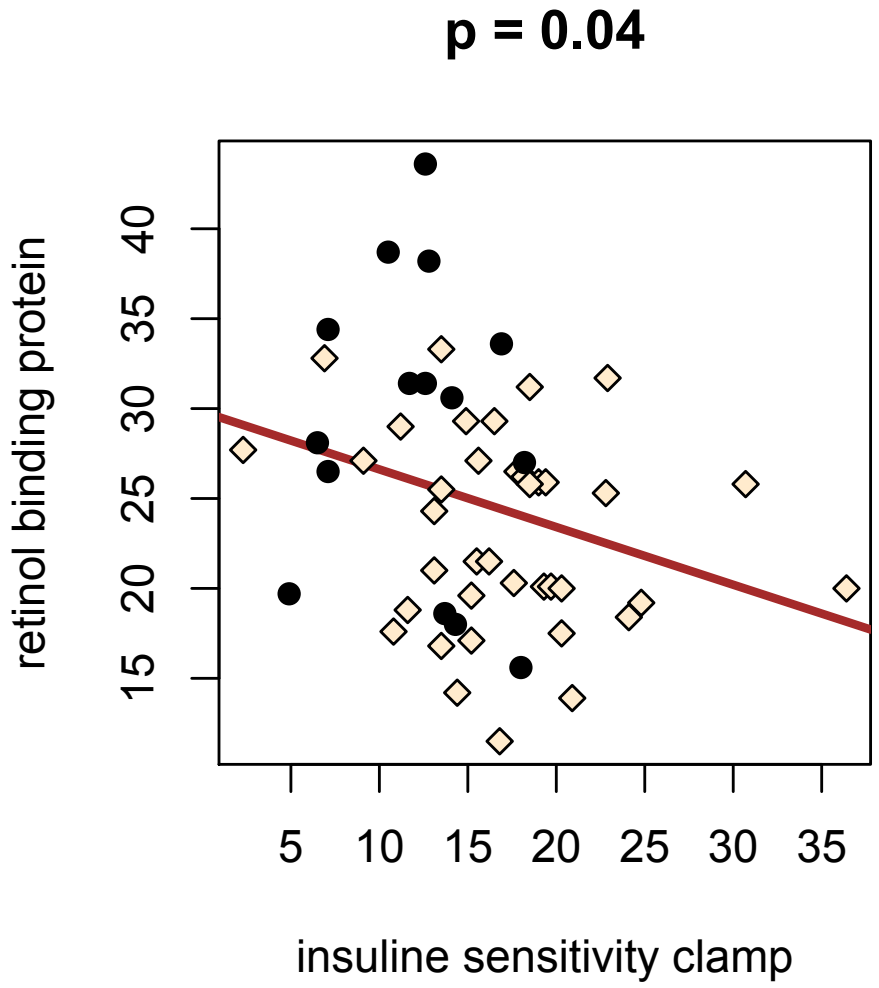


p = 0.04



il modello proposto è significativo ..

	stima	S.E.	P
q	29.83	2.57	0.00
m	-0.32	0.15	**0.04**

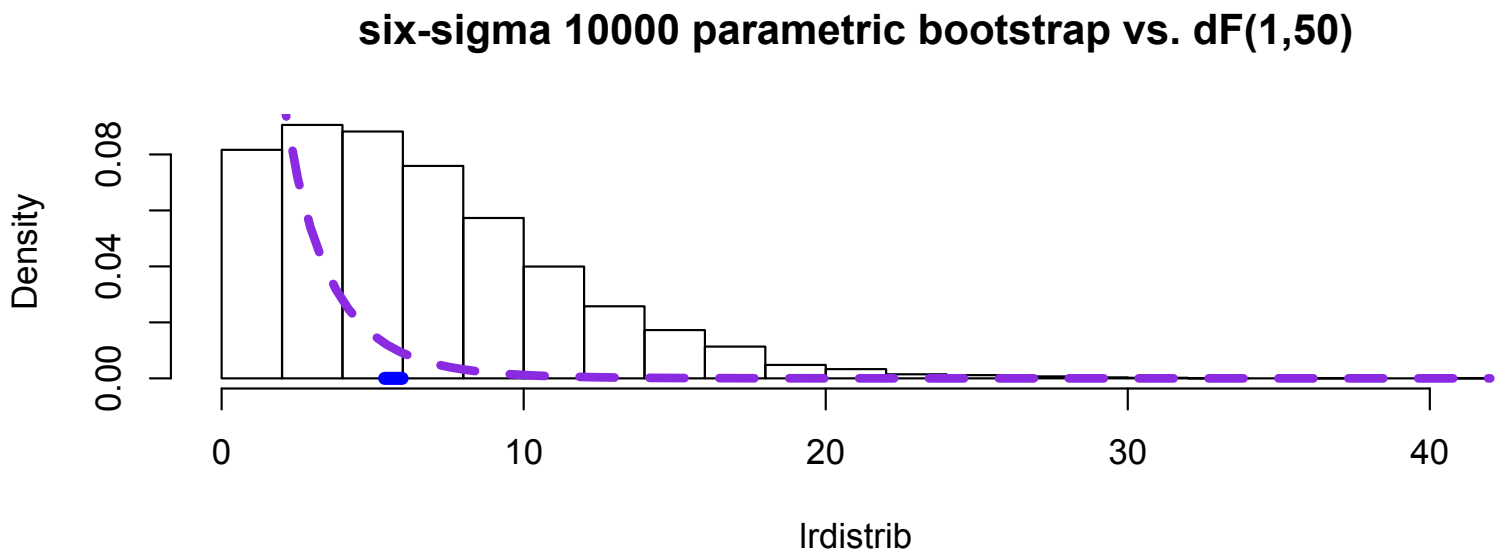


.. ma il modello proposto NON è verosimile

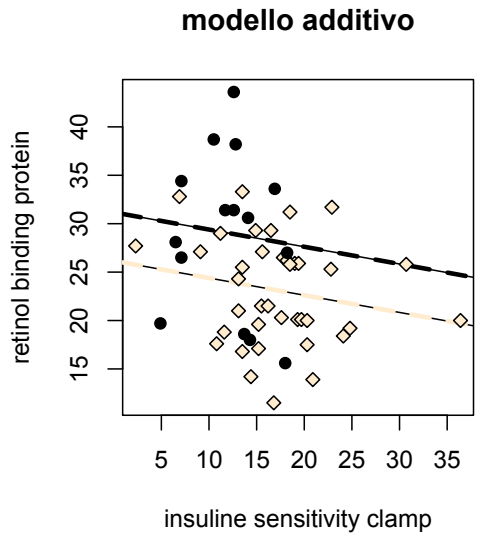
	Res.Df	RSS	Df	P
modello 2	50	2035.5		
modello 3	51	2266.1	-1	**0.02**

.. detto tra di noi ..

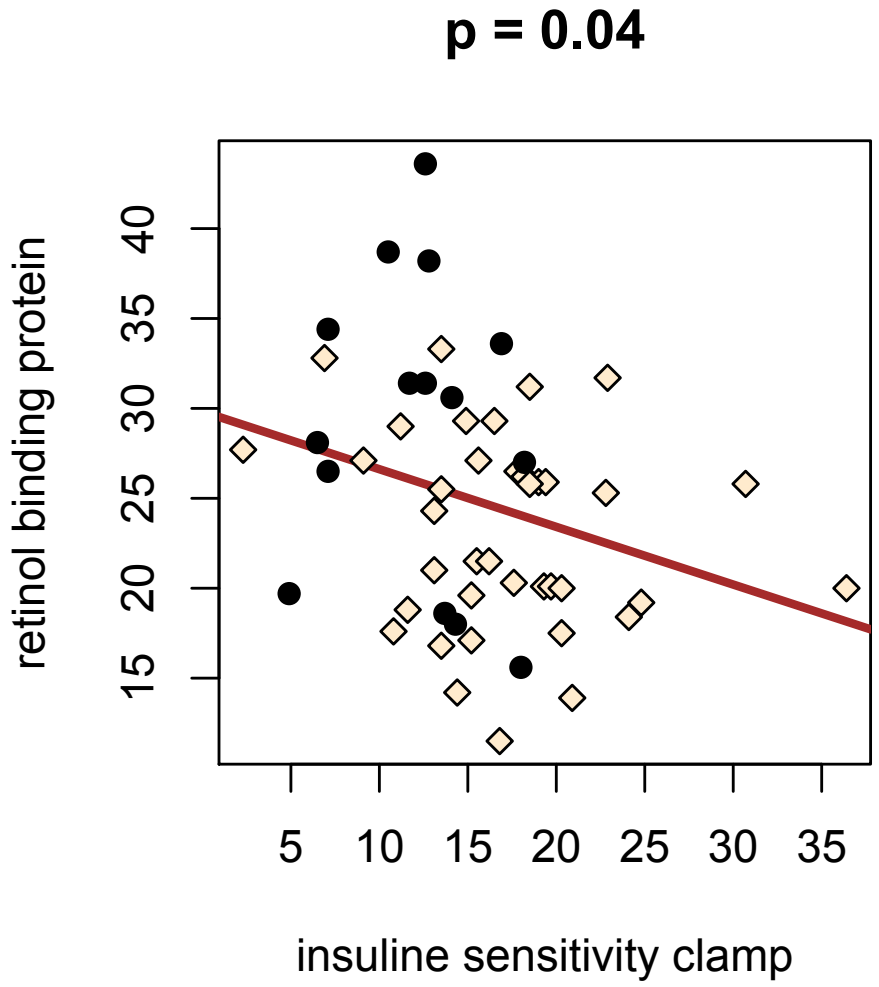
```
howmany = 9000
lrdistrib = numeric(howmany)
for (i in 1 : howmany)
simul = unlist(simulate(model2))
bootnull = lm ( simul ~ serumprotein )
bootalt = lm ( simul ~ serumprotein + group)
lrdistrib[i] = as.numeric( 2*(logLik(bootalt) - logLik(bootnull)) )
lrts = as.numeric( 2*( logLik(model2) - logLik(model3)))
```



Perchè il modello proposto non è verosimile?

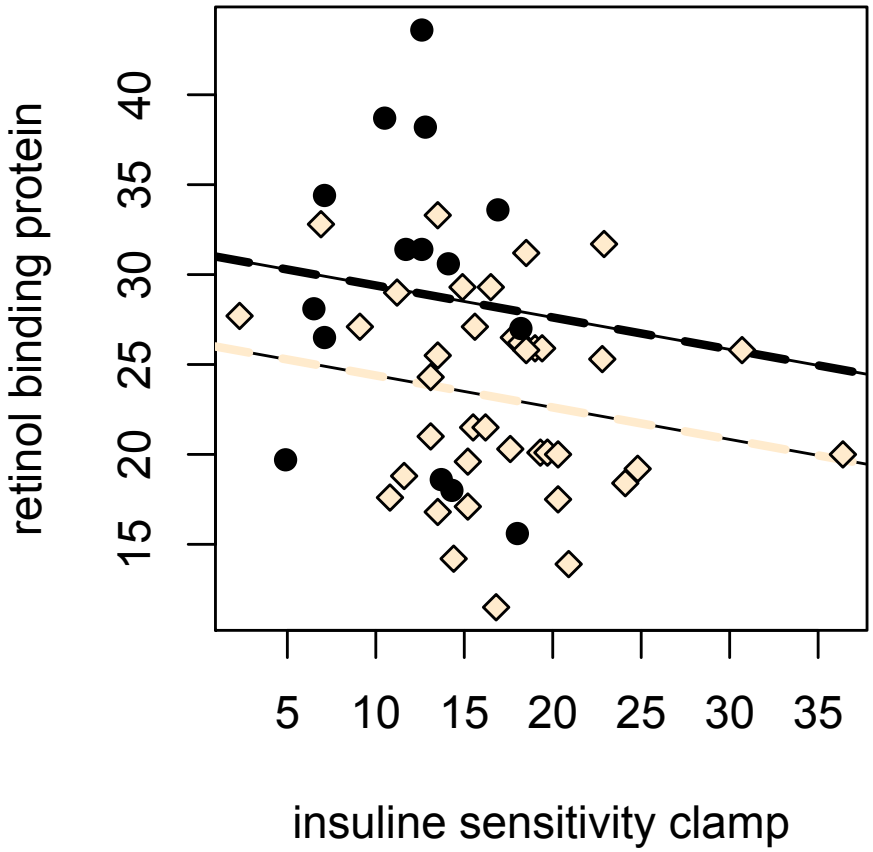


	stima	S.E.	P
q	31.17	2.52	0.00
m	-0.18	0.16	**0.27**
δq	-5.00	2.10	**0.02**

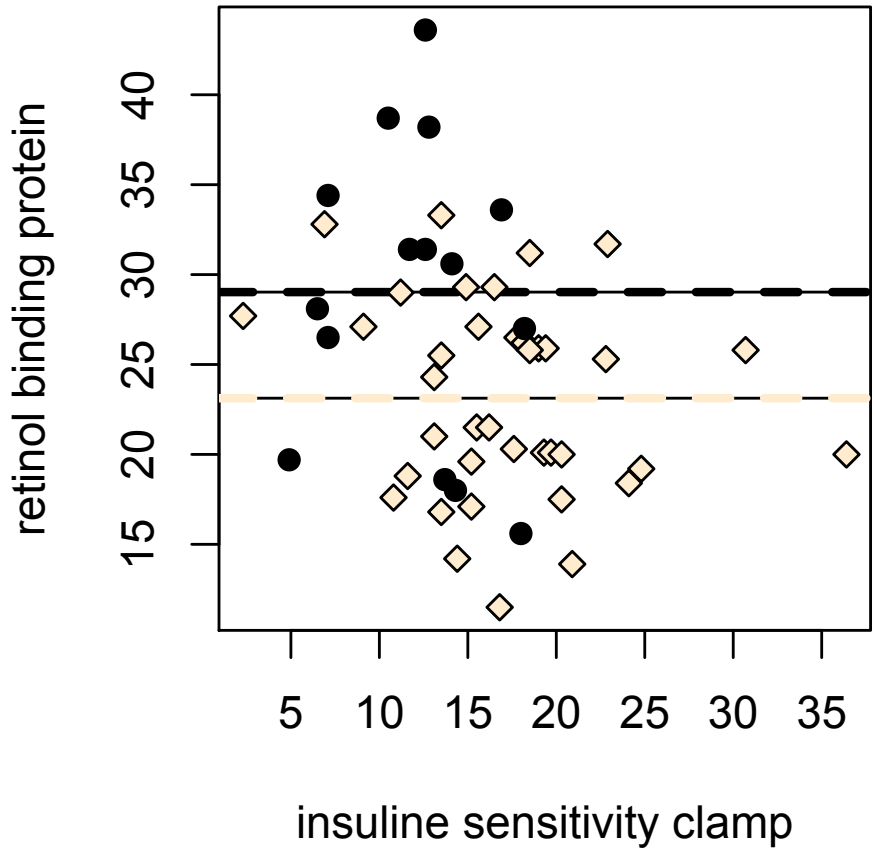


il modello minimale adeguato

modello additivo



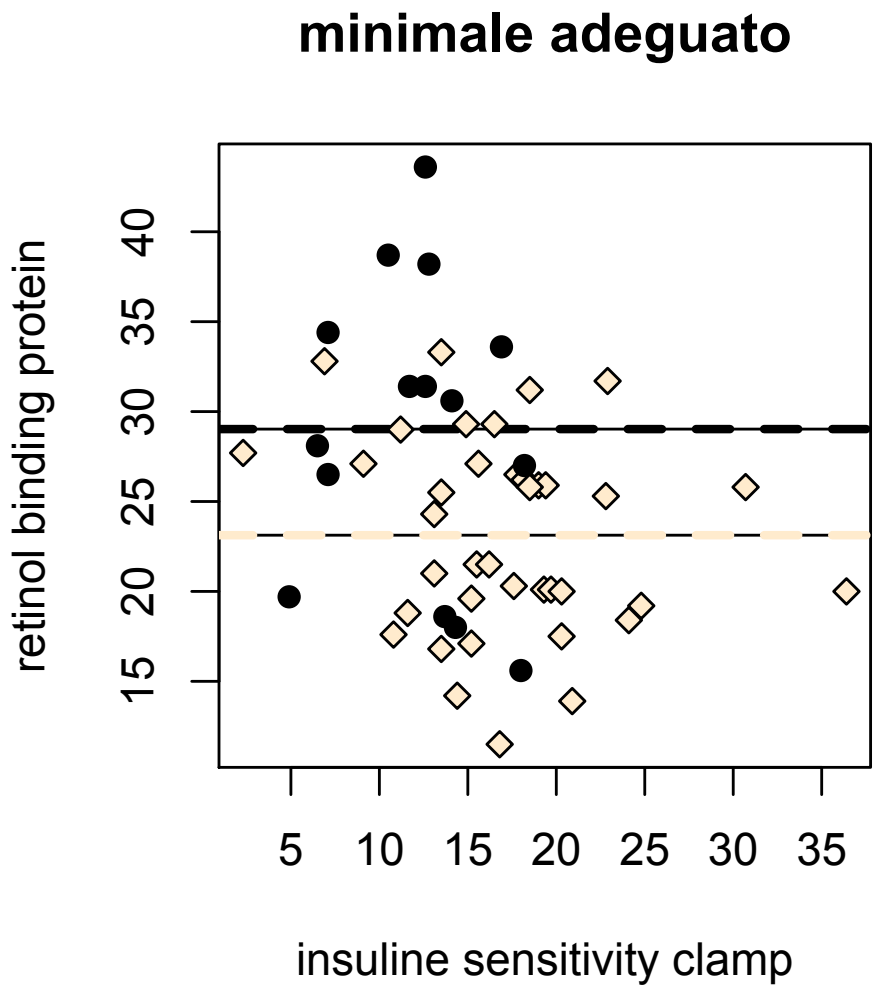
minimale adeguato



il modello minimale adeguato

	stima	S.E.	P
q	29.83	2.57	0.00
δq	-0.32	0.15	0.04

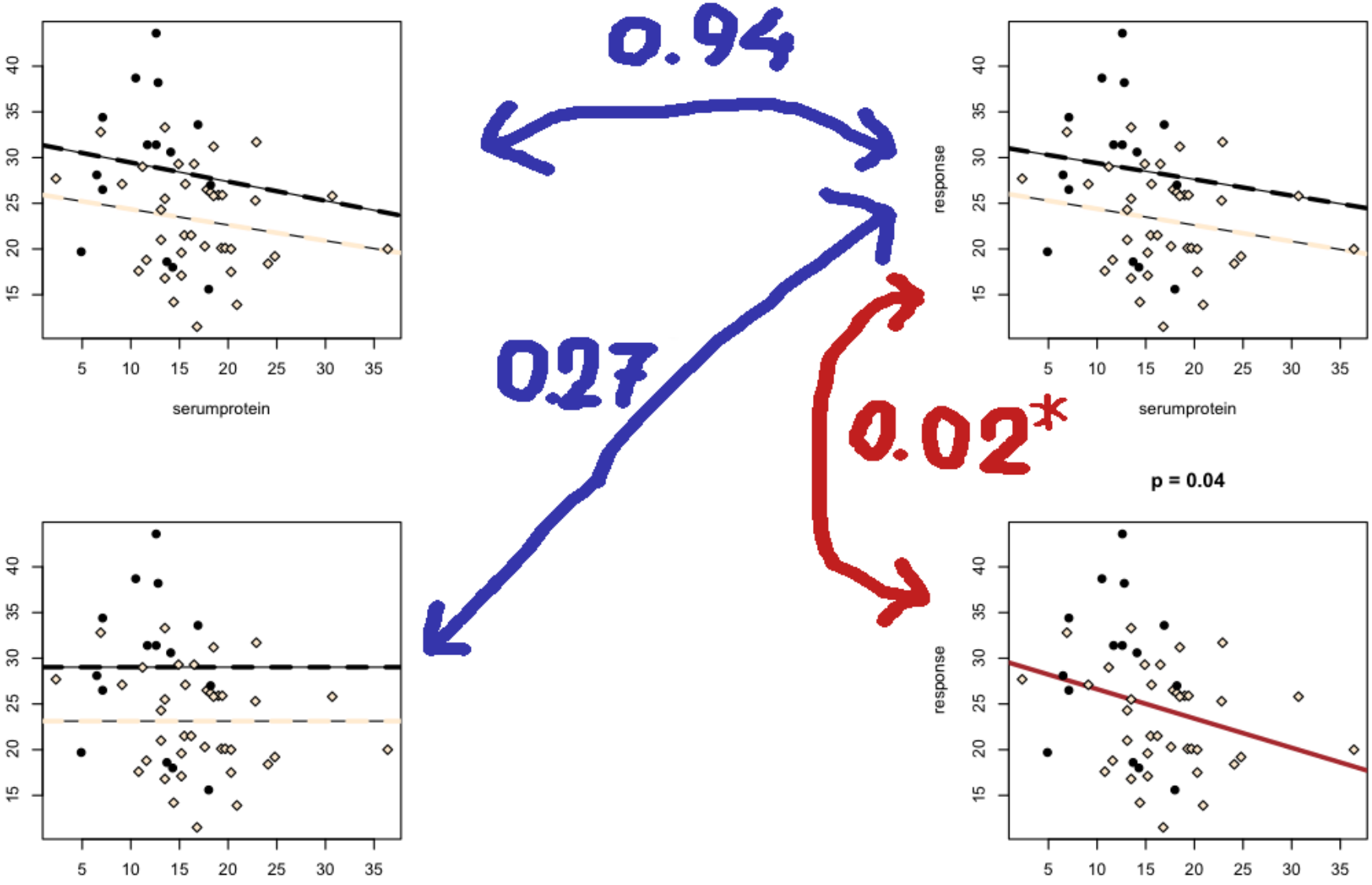
devianza = 2086.9



il modello minimale adeguato

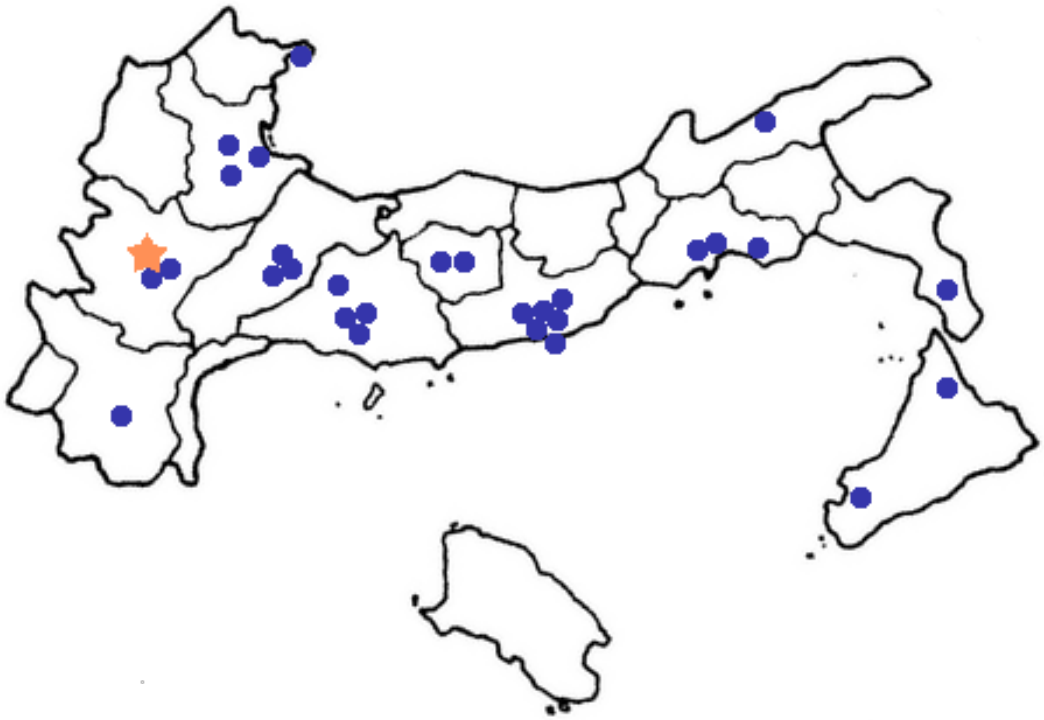
	Res.Df	RSS	Df	P
modello 2	50	2035.5		
modello 4	51	2086.9	-1	**0.27**

riassunto



"Data analysis" leading to valid inference is the integrated process of careful a priori model formulation, model selection, parameter estimation, and measurement of precision (including a variance component due to model selection uncertainty). We do not believe that model selection should be treated as an activity that precedes the analysis; rather, model selection is a critical and integral aspect of scientific data analysis that leads to valid inference.

Michael Thun notes, "... you can tell a little thing from a big thing. What's very hard to do is to tell a little thing from nothing at all"



concludendo, ricorderemo che:

Contents lists available at SciVerse ScienceDirect

Gynecologic Oncology

journal homepage: www.elsevier.com/locate/ygyno

Differentiating stage 1 epithelial ovarian cancer from benign ovarian tumours using a combination of tumour markers HE4, CA125, and CEA and patient's age

Srinivas Kondalsamy-Chennakesavan [a,b,c], Andreas Hackethal [d,e], David Bowtell [c], on behalf of the Australian Ovarian Cancer Study Group, Andreas Obermair [d,e,*]

[a] *Rural Clinical School, School of Medicine, The University of Queensland, Australia*
[b] *Centre for Rural and Remote Area Health, University of Southern Queensland, Australia*
[c] *Peter MacCallum Cancer Centre, East Melbourne, Victoria, Australia*
[d] *Royal Brisbane and Women's Hospital, Queensland Centre for Gynaecological Cancer, Herston QLD 4029, Australia*
[e] *The University of Queensland, Central Clinical Division, Herston QLD 4029, Australia*

concludendo, ricorderemo che:

Table 4
Multivariate logistic regression model showing association of biomarkers with malignancy.

	OR	95% CI		p
Premenopausal				
HE4 (log)	2.13	0.87	5.20	0.098
CA125 (log)	1.27	0.81	2.00	0.292
CEA (log)	1.44	0.72	2.86	0.300
Age at diagnosis	0.96	0.87	1.05	0.391
Postmenopausal				
HE4 (log)	4.17	1.36	12.77	0.012
CA125 (log)	1.43	0.89	2.28	0.136
CEA (log)	0.50	0.21	1.19	0.117
Age at diagnosis	0.89	0.82	0.96	0.004
Combined (pre- and postmenopausal)				
HE4 (log)	2.60	1.34	5.04	0.005
CA125 (log)	1.30	0.95	1.78	0.096
CEA (log)	0.93	0.57	1.52	0.779
Age at diagnosis	0.99	0.96	1.03	0.708

concludendo, ricorderemo che:

Radiol med (2013) 118:1269–1280
DOI 10.1007/s11547-013-0926-y

CHEST RADIOLOGY
RADIOLOGIA TORACICA

Evolution of the subsolid pulmonary nodule: a retrospective study in patients with different neoplastic diseases in a nonscreening clinical context

L'evoluzione del nodulo polmonare subsolido: studio retrospettivo in pazienti con differenti patologie neoplastiche non sottoposti a screening

Domenico Attinà[1] • Fabio Niro[1]• Margherita Stellino[1] • Federica Ciccarese[1] • Giangaspare Min
Nicola Sverzellati[2] • Maurizio Zompatori[1]

concludendo, ricorderemo che:

Statistical analysis

The Bland-Altman test was used to evaluate inter-observer variability: for each SSN, the difference between the measurements performed by the first and the second observer was calculated for both the baseline and the follow-up HRCT. Correlations between the baseline CT features and the evolution of nodules were analysed with the Pearson's chi-square test. The relationship between the baseline size of SSN and their evolution was studied by using the ANOVA test with Bonferroni correction. The prevalence of SSN changes in relation to the patients' characteristics (sex, age, smoking history) was analysed with a COX survival analysis model. All statistical analysis was performed using SPSS (Statistical Package for the Social

concludendo, ricorderemo che:

SSN generally display slower growth rates as compared to solid lesions. Reported doubling times are 988±470 days for AAH, 567±168 days for BAC and 384±212 days for mixed subtype adenocarcinoma with BAC component [8]. Focal interstitial fibrosis also persists over a prolonged follow-up period and its growth pattern over time it still unknown [9].

concludendo, ricorderemo che:

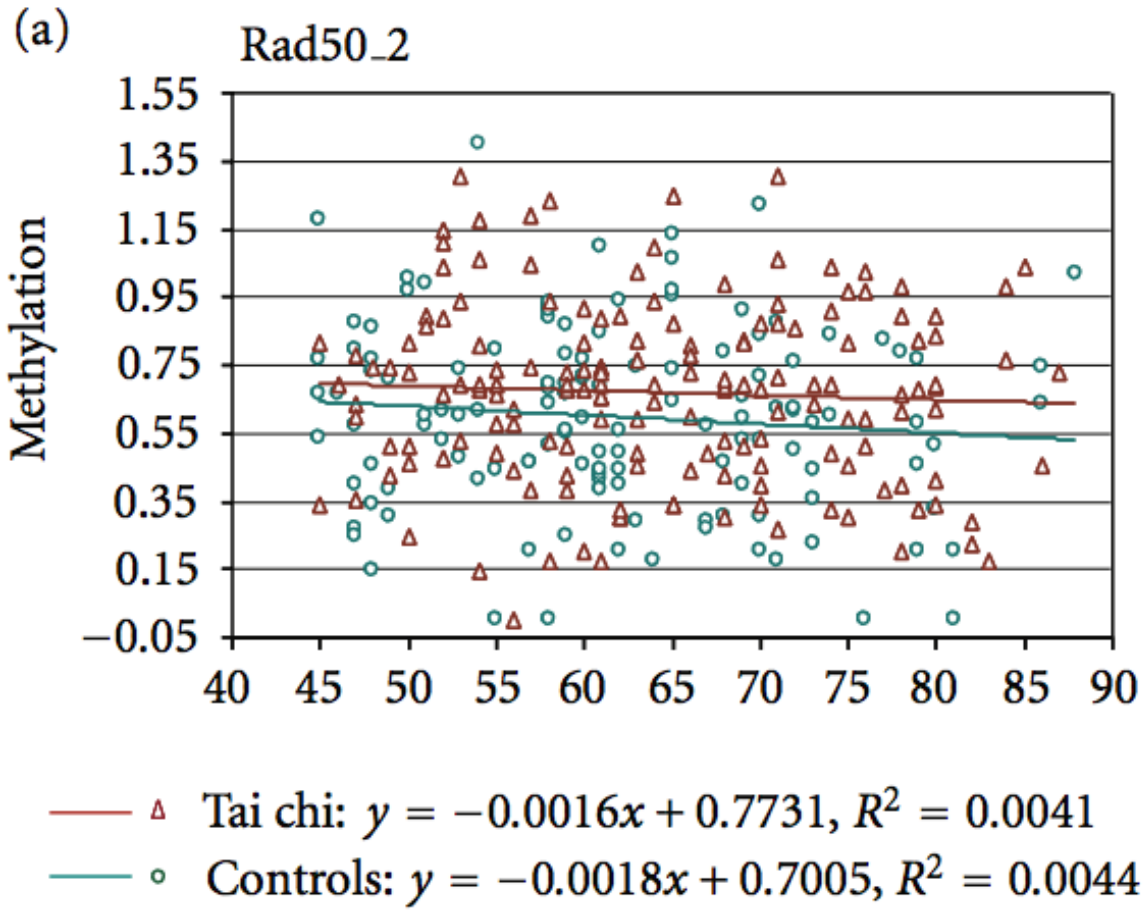
Research Article

Epigenetic Changes in Response to Tai Chi Practice: A Pilot Investigation of DNA Methylation Marks

Hua Ren,[1] Veronica Collins,[2] Sandy J. Clarke,[3] Jin-Song Han,[4] Paul Lam,[5] Fion Lara M. Williamson,[1] and K. H. Andy Choo[1,6]

concludendo, ricorderemo che:

Evidence-Based Complementary and Alternative Medicine

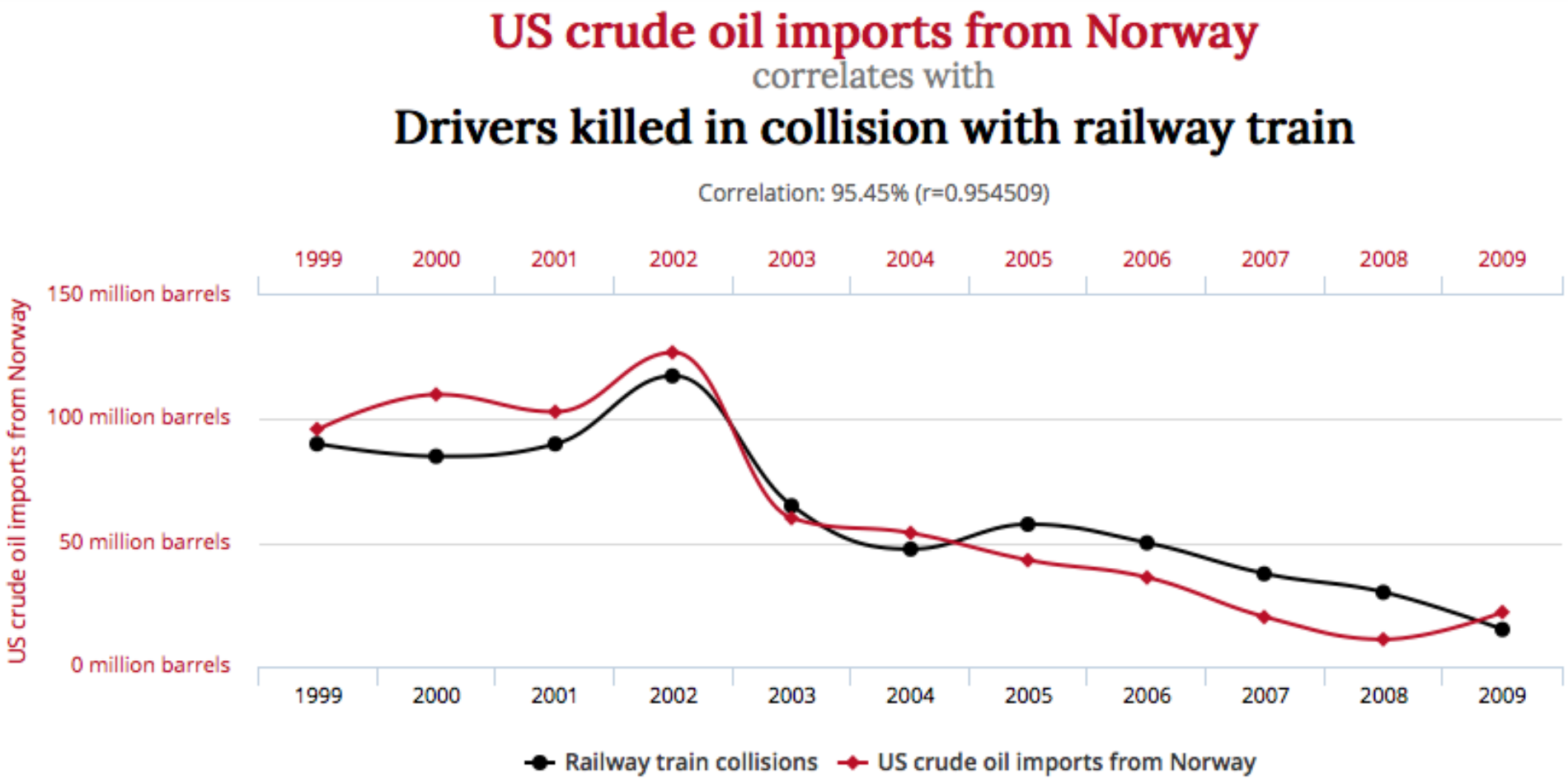


concludendo, ricorderemo che:

5. Conclusion

This work has provided preliminary evidence that tai chi practice may be associated with measurable beneficial epigenetic changes. The ability to measure such changes at the molecular level opens up the possibility of designing new and objective approaches that can be used to delineate the biological mechanisms and the health and therapeutic efficacies of tai chi. Such approaches may also benefit the study of other popularly used forms of complementary and alternative medicine interventions such as acupuncture, herbal medicine, meditation, qigong, Reiki, Shiatsu and yoga.

concludendo, ricorderemo che:



concludendo, ricorderemo che:

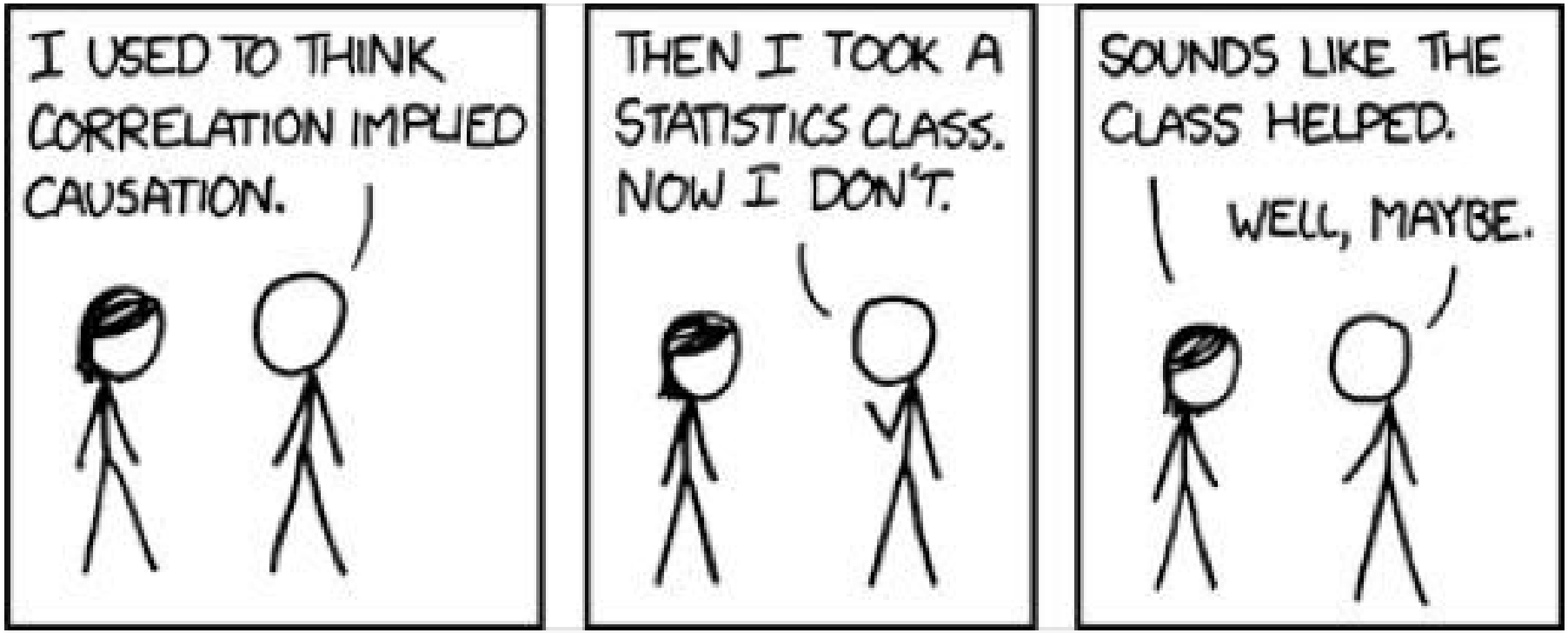
MOISES NAIM SENZA FRONTIERE

SENZA TETTE NON C'È PARADISO

Lo scrittore colombiano Gustavo Bolívar intitola così un suo libro la cui trasposizione televisiva ha conseguito un successo internazionale. La[...]ne di età compresa tra i sette e i cinquant'anni in diversi paesi, nel quale ha chiesto a ogni intervistato di classificare secondo l'aspetto fisico un certo numero di persone presentate in fotografia. La prima sorpresa è stata che ovunque nel mondo, in[...]sioni, riscontrando che i più attraenti erano anche quelli più frequentemente scelti come leader.
I risultati di Hamermesh coincidono con altri studi secondo i quali la statura fa au[...]

[...]zionare che i soldi non sono l'unico biglietto per il paradiso economico. Anche i denti lo sono. È proprio così: coloro che hanno i denti più belli guadagnano di più. Il valore economico dei denti è il titolo di un lavoro con il quale Sherry Glied e Matthew Neidell dimostrano che le donne che hanno i denti più belli guadagnano il 4 per cento in più rispetto a quelle che hanno i denti più brutti.

concludendo, ricorderemo che:



ringraziamento

UNIVERSITÀ
DEGLI STUDI DI TRIESTE

SOCIETA' DEI MATEMATICI
E NATURALISTI DI MODENA
www.socnatmatmo.unimore.it

Massimo Borelli
borelli@units.it

Dipartimento di Matematica e Geoscienze
via Alfonso Valerio 12/1
34127 Trieste

bibliografia