SESSION IN MEMORIAM OF COSTAS GOUTIS

Rosario Romera (Ed.)

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WORKING PAPERS

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Costas Goutis died on July 21, 1996. He was at that time a visitor at the Universidad Carlos III de Madrid. The Department of Statistics and Econometrics of this University organized a special session in memoriam of Costas Goutis on September 25th, 1996.

This is a summary of the memorial session. Daniel Peña gave a brief introduction as chairman of the Department. Cornell University was represented by George Casella and the University College London by Phil Dawid, Costas' brother Theodoris and sister Dina were also present. Rosario Romera participated in the name of the Department and acted as Editor of this report.

WORDS FOR COSTAS
DANIEL PEÑA

I want to thank our invited speakers, George Casella from Cornell University, Phil Dawid from University College, and Rosario Romera from our Department, for accepting our invitation to participate in this memorial session for our friend and collegue Costas Goutis. They represent the three periods in Costas'professional life: his research trainning as a Ph. D. student in Cornell, his work as a young Assistant Profesor in London and his maturity as a researcher in Madrid. We are very thankful that they are here today to share with us their knowledge about Costas'life and work.

We feel very fortunate to have here Dina, Costas's sister and Theodoris his brother. In this way they can bring to their family our condolence and our friendship in this moment of loss.

The Department has proposed to the Rector of the University that this seminar room will be called Sala Costas Goutis after him. Our proposal has just been accepted and this room has received today a plate with his name. In this way his memory will be always alive in our department.

I would like to finish with a personal experience with him. A few days after he arrived to Madrid he told me he liked playing chess. I do too and I invite him to come to my home to play chess together. We talked, played chess and he stayed for supper. During the meal my older son, Jorge, who was then eighteen, start asking Costas all type of questions about his life and we learned about his pacifist ideas, his love for music and for sharing ideas and his passion for travelling. When Costas left, Jorge was very much impress by him and his life that he saw as full of joy and adventure. Then he came to me and said: you know, you have to bring home more often guys like this one because, he is ... he doubted a little bit and finally said: you know, he doesn't look as a statistician!. As I know my son I can garantee that this is a great compliment!

I liked Costas very much and I have the highest appreciation for his work. He was a very succesful human being and I am very honour to have had him in this Department as a friend and as a colleague.

SOME OF GEORGE´S MEMORIES
GEORGE CASELLA

Costas came to Cornell in the fall of 1985 with a bachelors degree from the University of Athens. Typically, a student with a bachelors, starting a PhD, will take five years at Cornell. If the student is really excellent, it is possible to finish in four years. Costas took three and a half years, because he wanted to spend his final semester exploring South America. I still remember the day he came into my office to "ask permission" to spend the Spring semester in South America, and I still remember my answer, "Sure, as long as you leave me a disk with your complete thesis, I don´t want to lose a publication if you fall of a mountain". While on the subject of a thesis. I suggested a problem to Costas about constructing shorter confidence intervals for a normal variance, but said that I thought it was really hard, perhaps unsolvable. He solved it. While in South America, Costas was looking for a job. As he was trekking through the mountains, he had no access to a phone and could not get mail, so there was no way of telling him about the jobs. Throughout South America there are "Latin American Explorers Clubs", which are essentially huts with a phone. Every two weeks, on Friday at 11 am, I would call Costas at a designated club and inform him of the job prospects. This is how Costas got his job at UCL in Phil Dawid´s department. For those of you who know Phil, picture yourself explaining to Phil the whereabouts of your genius student.

In addition to South America, while he was in graduate school, Costas tried to see as much of North America as possible. I can´t remember all of the places that he went, but I remember that in addition to spending a year in the midwest, he drove to Labrador and also visited San Francisco. He continued to travel throughout his life, visiting South America again, and Israel, Zimbabwe, Jordan, Greenland, not to mention the UK, France and Spain. He was a fluent in five languages, truly a citizen of the world.

Costas was, perhaps, born 10 years too late. In many ways he was a child of the sixties. I remember that when I invited him to come to Cornell in 1991 he was hesitant because Cornell had a lot of money from the Army, and he categorically refused to take any money from the army. He would pay his own way instead. This also illustrates Costas´complete lack of interest in material things. His interests were people and knowledge, in that order. When he traveled, he would spend an enormous amount of time in one place (like THREE WEEKS in Greenland!). But his reason was simple. He wanted to understand the place, and the people. That was important to him .

He was an adventurer. He was also a dear friend, and I loved him like a son. I will miss him very much.

The Costas Goutis Memorial Travel Award will be give each year to the Cornell Student who best combines innovative statistics with exotic travel. The inscription on the award will read:

In memory of our friend and colleague, whose spirit of adventure and love of travel was only surpassed by his love of statistics, the Costas Goutis Memorial Travel Award is given to the Cornell University Statistics or Biometry graduate student whose travel plans, the more unusual the better, best illustrate Costas' love of innovative statistics and exotic travel.

PHILIP DAWID'S NOTES.

I speak today in memory of Costas Goutis, not only in a personal role, but also as a representative of my colleagues who knew him well and loved him and worked with him, at the Department of Statistical Science, University College London, where he spent the period from October 1989 to September 1995. We will never forget Costas, and the impact he had on us.

When in 1989 we were looking to appoint two new lecturers (the "careeer grade" for academic staff in Britain), we received his application via George Casella. Costas himself was making a long trip around Central and South America, to relax after completing his PhD in record time, and was very difficult to contact. However, his application, and the recommendations that came with it, were so strong that we decided to offer him a job without even interviewing him. This was a potentially dangerous gamble, since such jobs are effectively tenured, and we might have been stuck for ever with somebody completely unsuitable. However, it was a gamble that succeeded splendidly.

Having made our decision, the next problem was to inform Costas. Letters were sent to various Poste Restante addresses all over South America, and we eventually tracked him down to Lima, Peru. A telephone call ensued between him and the Head of Department, Rex Galbraith, that was so noisy that the only way Costas knew he wasn't being told that he hadn't got the job was because such a call would obviously not have been made.

There followed some negotiation about how long he would stay with us. He didn't want to commit himself for long: he wasn't interested in a permanent job in London, he was really looking for a one-year visiting post. We were looking for somebody who would stay permanently. Again, it wasn't easy to communicate at this distance, but we did reach a compromise that he would stay for two years. In the event he stayed for six. Considering his perpetually "itchy feet", we were very proud that we were able to hold him down for so long.

Eventually he decided the time had come to move on, and deliberated as to where to go next. He considered various exotic places - he was offered a position in Hong Kong, for example -but he finally decided that the right place for him was here at Carlos III. It was your great good fortune to have had the opportunity to get

to know this remarkable person; and your great loss, and ours, that you were to know him for only one year. Clearly he has made a strong impression on you in that time- he was a person who always made his mark very quickly; but he could have contributed so much more to this Univesity.

Let me tell you about Costas's career at University College. He did an enormous amount of varied teaching, including courses on Decision Analysis, Analysis of Structured Data, Probability Theory, Linear Models, Operational Research, Social Statistics, and S-Plus. He was always keen to take on topics which he didn't have a background in, and develop and teach them; he had an irrepressible enthusiasm for taking on new responsibilities.

His enthusiastic teaching inspired his students, who loved him and responded to him -he was a very successful teacher and supervisor. Such was his impetus and enthusiasm that at least two of the student projects he supervised- I'm talking of undergraduate and Master's level dissertations, not PhD -became fully fledged publications.

I don't know what it's like here, but in Universities in England much of the administration has to be done by academic staff. Costas had various administrative tasks, which he took on with his customary enthusiasm and efficiency, combined with a very healthy scepticism for all that he regarded as unnecessary bureaucracy. He had strong feelings about good and bad ways of doing things, and he regarded most of the ways in which things were organised as pretty bad, and would try and find a sane way through the stupidity of it all as best could. He clearly found many of these tasks frustrating, but nevertheless gave everything he had to them. For example, he was our Examinations Officer, a demanding post that involves overall organisation of the examinations, bullying colleagues to meet the rigid timetable, etc. He brought to this fundamentally tedious job the leaven of his scepticism and good humour. Susan Pitts, who shared his office for a time, tells that at one point he chalked a date, about two years away, on the corner of the blackboard. Asked to explain, he said: "The College is thinking of introducing a more sensible system for transferring examination marks from one Department to another. I don't believe it will happen before this date". He was right.

We also relied on Costas to supervise our tangled computer system, and sort anything that went wrong. This was a very time-consuming task, which he again took on with great efficiency, in spite of its frustrations. We wanted to call him our "Computer Manager", but in his characteristically modest way he refused any such title, saying "No, I'm just a fixer of computers".

As my Spanish is poor, I'm not quite sure what George Casella has already told you about Costas'research. Given that there were only about six years between his completing his doctorate and his death, his research output is phenomenal. Around 16 papers have been published, and about 5 or 6, maybe more, are under consideration by journals. Many of these are joint with others, and I hope that they will eventually appear.

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With George Casella as his supervisor, naturally Costas' background and interest when he came to us from Cornell was in Decision Theory. He continued to develop this interest and his collaboration with George while at University College, but he also moved off in new directions. One was related to work of my own on graphical modelling and probabilistic expert systems. Costas developed a very interesting and valuable application of such methods to Decision problems. In this he demonstrated one of his many great strengths, that is a very powerful geometric intuition - a talent that is all too rare these days. His most recent paper appeared in Annals of Statistics just before I came here. it demonstrates, by delicate geometrical arguments, that the partial least squares estimator shrinks. There are not usually very many pictures in Annals of Statistics, but there is wonderful diagram in this paper, showing a highly multivariate space with lots of subspaces, linear operators, etc. I understand that he was asked by a referee if he couldn't rework his approach to this work to base it on manipulating matrices, rather than on geometry. Costas felt that his geometric approach was the natural, insightful one, and that was what was being asked of him would result in making something intrinsically simple more complicated. He refused to compromise, and the geometric proof was published.

This refusal to compromise was very characteristic of Costas. He was a man of very strong principles, in both his personal and his professional life. For example, surely one of the reasons for his wandering around the world like Odysseus was his strong conscientious objection to military service, leading to his virtual exile from his homeland. Greece's loss was the world's gain, but for all too short a time.

As well as producing much varied work in his own right, Costas developed extensive collaborative work with University College colleagues. In my own case, this was restricted to a short commentary on a paper by Nancy Reid on "Conditional Inference", a topic dear to both our hearts. More substantially, working with Tom Fearn and Mervyn Stone he developed sophisticated multivariate theory for real practical problems of complex instrumentation. Although his special strengths were in theoretical Statistics, he was always concerned that the things he did should be useful for important applications. Had he lived, this work could well have been of landmark importance. Just a few days before his death, Costas and Tom sent a proposal to a publisher for a book dealing with biased estimation in multivariate Statistics. Sadly, that venture has died with Costas.

In collaboration with Rex Galbraith, Costas involved in Fission Track Dating, a Geological method of dating ancient specimens by means of radioactive decay, which raises some very interesting and complex statistical problems. Costas and Rex had just finished a joint paper, which will appear in due course.

I can also speak warmly of the work Costas did for the profession. He was an influential invited speaker at a number of international meetings. When I was Editor of Biometrika, he was a much valued referee, and I learned to rely on his sound judgement. He brought to these tasks, as to everything else he did, a highly professional efficiency and conscientiousness, but also a very individual touch of humour.

Personally, I remember Costas as a very special individual. One couldn't fail to be enraptured by his unique laugh, his tremendous delight in everything

that happened around him. His humour lightened the burden of the general stupidity of things, revealing a strong sense of the ridiculous. In his travels, Costas liked to send postcards to his friends and colleagues. We received one from Jordan, saying "Christmas in Jordan is great -they don't have it". In his files on examinations we discovered one labelled "Useless information -keep".

Costas was an extremely hard-working, concerned, conscientious person. I don't know how many hours a week he must have devoted to his work. Those of us who would occasionally come in the evenings or at weekends would invariably find that Costas was already there. And this effort, coupled with his natural talent, was paying off: although he was only six years into his career, already he was admired and appreciated all over the world.

There will be many to mourn and regret the loss to the world that Costas'early death has caused. It's impressive and heartening to see memorials being set up by the various places with which he was associated. As George will have told you, at Cornell there will be travelling scholarship in his memory. The Fred Hutchinson Cancer Center in Seattle, which he was visiting at the time of his death, is proposing to put up a memorial plaque. Here at Carlos III I am happy to see that we are meeting in the Costas Goutis seminar room, which also contains a plaque in his memory. At University College, we have instituted the Costas Goutis Research Prize.

All this testifies that, although his career was so tragically ended at such a young age, Costas had already made an enormous impression, both personally and professionally, on the world. All who knew him, as friends and colleagues, must regret and deplore the loss to the world, as well as being deeply affected by our own personal losss.

Let me end by joining with Christian Robert, a close friend and collaborator of Costas' from student days, in his prayer: "May he hike forever among the stars!".

IN MEMORIAM OF COSTAS GOUTIS
ROSARIO ROMERA

It is a great honour for me, to represent my department in this act in memoriam of Costas Goutis.

Thinking about how to summarize this loss in an accurate, direct and brilliant sentence, I decided to get help from the Classical Literature where premature death and promising future, glory, appear together. And I found it in several quotes in different languages and different historical moments....but nothing was so suitable as the words of the greek poet Plautus in his Bacchiades:

"Those who are chosen by the Gods are due to die in their youth"

In our scientific universe, I think that a generalized opinion is that Costas was definitely "a chosen one".

Costas joined this department in september 95 and most of us have the feeling that he would have liked to stay longer with us. Apart from personal considerations, there are professional reasons for this assertion. One reason is his declared interest in becoming an advisor, of some Ph D students in some topic dealing with Cross Validation Methodology. The other reason is the joint work in progress, at the time of his death, with people in this department. As far as I know, he planned to start this september two new cooperations: Bootstrap and Generalized Linear Models and Bandwith Selection in Nonparametric Regression using Bootstrap. About the latter the main idea was to improve the bandwith estimate using results of Härdle, Hall and Marron on the asymptotic covariance of an estimated bandwith, and the minimizer of the Mean Square Error of a kernel estimate. The hope was to use bootstrap to estimate the linear relation between these two bandwith estimators. Finally, Costas and myself have in progress a joint work in Partial Least Squares.

Our common interest in PLS was the reason why we started a collaboration in February 96. He already had experience with PLS and Chemometrics, and I had, and of course I still have, an special interest in PLS in relation to Quality and Satisfaction Indices. Let me explain roughly our joint work in the context of PLS methods.

PLS regression has been proposed as an alternative regression technique to more traditional approaches such as Principal Components and Ridge Regression. A very elegant paper by Stone and Brooks (JRSS, 1990) highlights these relations. A number of algorithms for PLS regression have appeared in the literature, both for the univariate and multivariate cases, have been shown to be equivalent. The implementation of the algorithms comparing theoretical measures of execution speed, is specially relevant in conection with problems of huge dimension as in Multivariate Calibration. A typical spectroscopic problem would be, to build a calibration model using fewer than ten standard samples, where there is the potential to measure absorption at hundreds of wavelengths. Although PLS is heavily promoted and used by chemometricians, it is largely unknown to statisticians. For example, there is a shrinkage effect in the Euclidean length of the PLS regression coefficient vector, in comparison with OLS, when applied to multicollinear predictor data. Such shrunken coefficients reduce the variance contribution to the Mean Square Error of prediction albeit at the cost of some bias. This result has been asumed as a property and supported by simulations without giving any proof (Technometrics 93). In a recent paper in the Annals of Statistics, entitled "Partial Least Squares Algorithm yields Shrinkage Estimators", Costas Goutis gives an elaborate proof based in geometrical arguments. In a paper forthcoming in JASA, Costas and Tom Fearn present a modification of the PLS algorithm that penalises roughness in the factor loadings. The choice of the penalty function used in this paper is motivated by Nonparametric Regression and Density Estimation. Finally Costas has also forthcoming in the Journal of Chemometrics "A Fast Method to Compute Orthogonal Loadings Partial Least Squares". A preliminary version of this paper has appeared as a Working Paper of the Universidad Carlos III de Madrid.

However, as Helland pointed out in his clarifiying paper in Communications in Statistics 88, the main disadvantages of PLS are his lack of known distributional properties, together with the fact that the method has been derived in a rather ad hoc way, not from any well-defined optimization principle. Progress in this second task has been done, but there is still an absence of results about distributional properties of PLS.

When Costas and myself decided to cooperate, we proposed several questions as a starting point. Some of them concern what happens if one chooses the wrong number of steps in the PLS algorithm measured, for example, in terms of the Asymptotic Prediction Mean Square Error. Another questions concern how to choose the number of PLS components, usually done by Cross Validation... Finally, we started with the most ambitious task which was to investigate the Asymptotic Distribution of the Sample PLS Components under the Relevant Components Population Model, proposed by Helland. In July we have obtained partial but very promising computational results, but Costas has never seen them. There is still a large amount of work to do according to our plans... and now to conclude, to write and to publish our results is a challenge for me.

After this cooperation my personal opinion, and I am sure that everyone in the department will agree, is that Costas was not only an extremely clever researcher and well prepared profesional, but also a great colleague. I was particularly impressed by his deep knowledge of the Geometry of the Statistical Methods. I have been told that his enthusiastic defence of Bayesian Methods, may have a "posterior" effect in some recent Astrophysics research. We will miss his valuable comments and remarks at the weekly departamental seminars, where he certainly took an active role. Costas gave two seminars in this department, one in October 95 "On some measurement and calibration problems", and the other in January 96 about "A graphical method for solving decision analysis problems"

After so many meetings with him, I also keep other kinds of memories like our particular jokes with his spanish, because he always wanted to speak our language. His very nice french was a good help in the fast improvement of his spanish. He was planning to give lectures in spanish for undergraduate students the current academic year.

Costas' office door was usually open, and this was more a symbol than an accident. We know very well that he welcomed profesional or personal talk from anybody, at any level. We will remember his strong and persistent laughter.

We also remember that Costas decided to buy a motorcycle perhaps trusting the beautiful spanish wheather. But it just happened to be the rainest season of the last five years. Of course this did not stop him from travelling to Alicante in his black monster thief-proof bike. In the garage we will miss his HONDA.

We will remember Costas as a brilliant colleague and a free spirit.

We, along with many others, will miss Costas a lot.

THEODORIS GOUTIS´WORDS

Costas´ brother thanks all the presents in the name of his family. He says that they are impressed by the international projection of Costas´ loss, both personally and professionally. He comments some details about Costas such as his love for mathematics since he was nine years old, his premature passion for travelling even around Greece on an old 1953 black (again) motorcycle. He states that meeting people was a high priority for Costas. Definitely he agrees that Greece was too small for him.