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STATISTICS AND FOLLOW UP OF DELPHI STUDENTS CAREER

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(this document and associated slides can be found on the Web at
http://wwwcn.cern.ch/~campore/delphi.html

In this memo we try to summarize some characteristics of the population of students who evolved within the frame of DELPHI since the proposal.

1. Data collection and definition

The information collection phase has not been easy: it has taken more than 5 months to be able to access the records of all the students.

What was requested for each former DELPHI student was relatively simple and terse information: year of degree, sex, **first** occupation after the degree with possibly a job description.

The education systems are very diversified between the various countries. I have tried to broadly group the degrees into two main types: doctoral studies and lower ranking degrees (diploma-like and master-like). Some countries do not have a master programme, some like France have essentially only doctoral programmes for physics studies and possibly lower level education for engineers. Other countries like Italy have started with a formal PhD programme only late during the time span of DELPHI and their "Laurea" would in general comprise thesis of widely different levels.

Whenever student counting was involved, if a student had got more than one degree within the DELPHI environment, only the higher level degree obtained has been included.

I have taken the responsibility to group the various jobs into somewhat wide categories aiming to define whether the individual had found a job in the public or private sector and within this first subdivision identifying broadly the skills used.

Trying to identify the level of security of any occupation has proven impossible. It should also be pointed out that the job is typically the first one a student got after his degree: the institutes loose track of former students beyond that. In this respect as I will show below the post-doctoral grants and in general the temporary jobs in the research sector like the CERN fellowships tend to inflate the number of people classified in the ***research*** category .

The categories are :

- ***Research***: this identifies all public-funded jobs within research structures or academic environments. It covers from post-doctoral grants to full professorship. In this category, academic positions in the field of informatics are included. It includes CERN posts like fellows.
- ***Teaching:*** besides lower grade schools it includes also third-world university posts which clearly are solely intended for teaching. In this category I have also included a missionary!
- ***Computing:*** includes all jobs in private firms related to computing and modelling skills. It comprises also some public funded computing jobs (e.g. coordination of the simulation of traffic in major city administration).
- ***Management:*** people who have become part of the managerial structure of firms or are acting as management consultants. I have also added to this category people who have been employed in public administrations.
- ***Business:*** in this category are people who are inserted in the business world other than computing and management. Owners of private enterprises are in this category.
- ***HighTech:*** everybody who has been hired by high/medium technology firms like electronics industry etc.
- ***Army:*** people either in the army or fulfilling their military duties
- ***Second degree:*** students who have decided to continue their studies in fields different from physics.
- ***Graduate school:*** students who have been successfully granted a doctoral study support (not necessarily within DELPHI).
- ***Unemployed:*** obvious meaning. This category is dominated by the students who got their degree in the last 12-18 months.
- ***Unknown:*** in this category fall mostly non-PhD students who graduated several years ago and for which track has been lost.

2. Global statistics

In the period 1982-1996, **501** students have obtained their degree with studies performed within the DELPHI experiment. One student got a job before formally completing his thesis.

Of these ***421*** *(84%) were male and* ***81*** *(16%) female.*

The types of degree were as follows:

PhD	227 (37 girls, 190 boys)
Masters	71
Diploma (including Italian Laureas)	242

Of the female students 42% got PhD degree which within errors is consistent with the figure of 45% for the male students.

Several people took more than one degree within DELPHI (not necessarily with the same institute)

Diplomas+PhD	27
Masters+PhD	8
Diploma+Master+PhD (real Delphi 'aficionados')	2

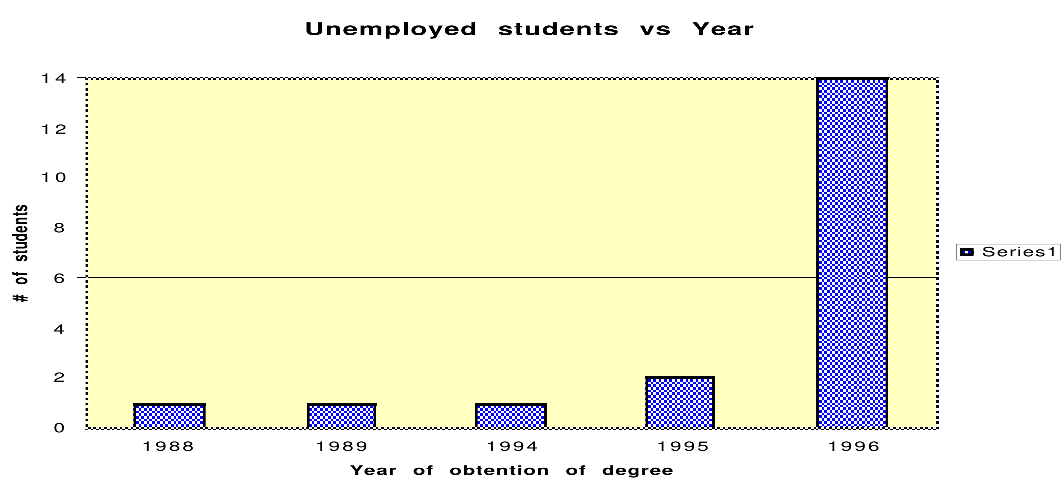
A certain number of DELPHI students continue their education career, either studying a different subject or by getting a doctoral grant:

Second degree	**1.0%**
Doctoral studies	**15.1%**

For those entering the professional life, assuming that the unknowns (**5.2%)** have a similar distribution to the others, the probability that a DELPHI student ends in one occupational category is <u>for their **first job** after obtention of the degree</u> :

Private sector	**37.5%**
and in more detail	
HighTech	21.3%
Computing	11.1%
Business	2.6%
Management	2.3%
Public sector	**57.7%**
and in more detail	
Research	52.6%
Teaching	4.4%
Army	0.8%
Unemployed	**4.8%**

The Unemployed (19) are typical students who have graduated in the last 12-18 months and who are still looking for a job as can be seen from the following plot.

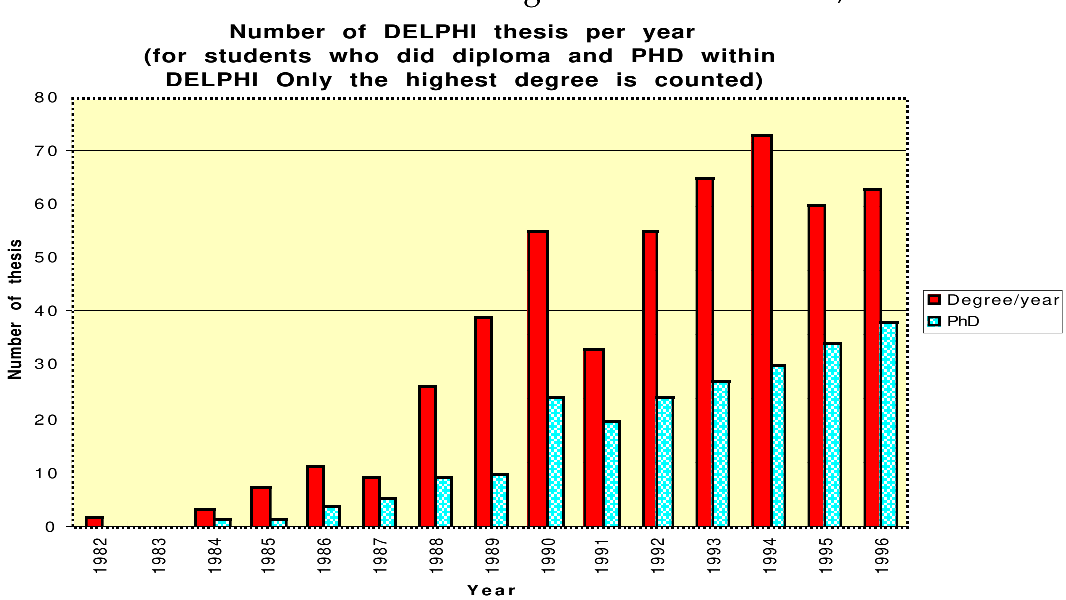


It should be pointed out that the probability of staying in research is a real upper limit. This number is heavily biased by the fact that it is relatively easy for good students (which seems to be the rule in our field!) to find a temporary research fellowship immediately after their degree. For certain countries like Germany, and possibly others, people can find better job conditions in the private sector if they have some post-doctoral employment experience. I could not collect information on this point in a systematic way, but the random sampling I could perform interviewing, for example, present german students, who keep in touch with former ones better than their institutes, confirms that a relatively large fraction of post-docs ends up in the private sector, typically in the high-tech or computing firms.

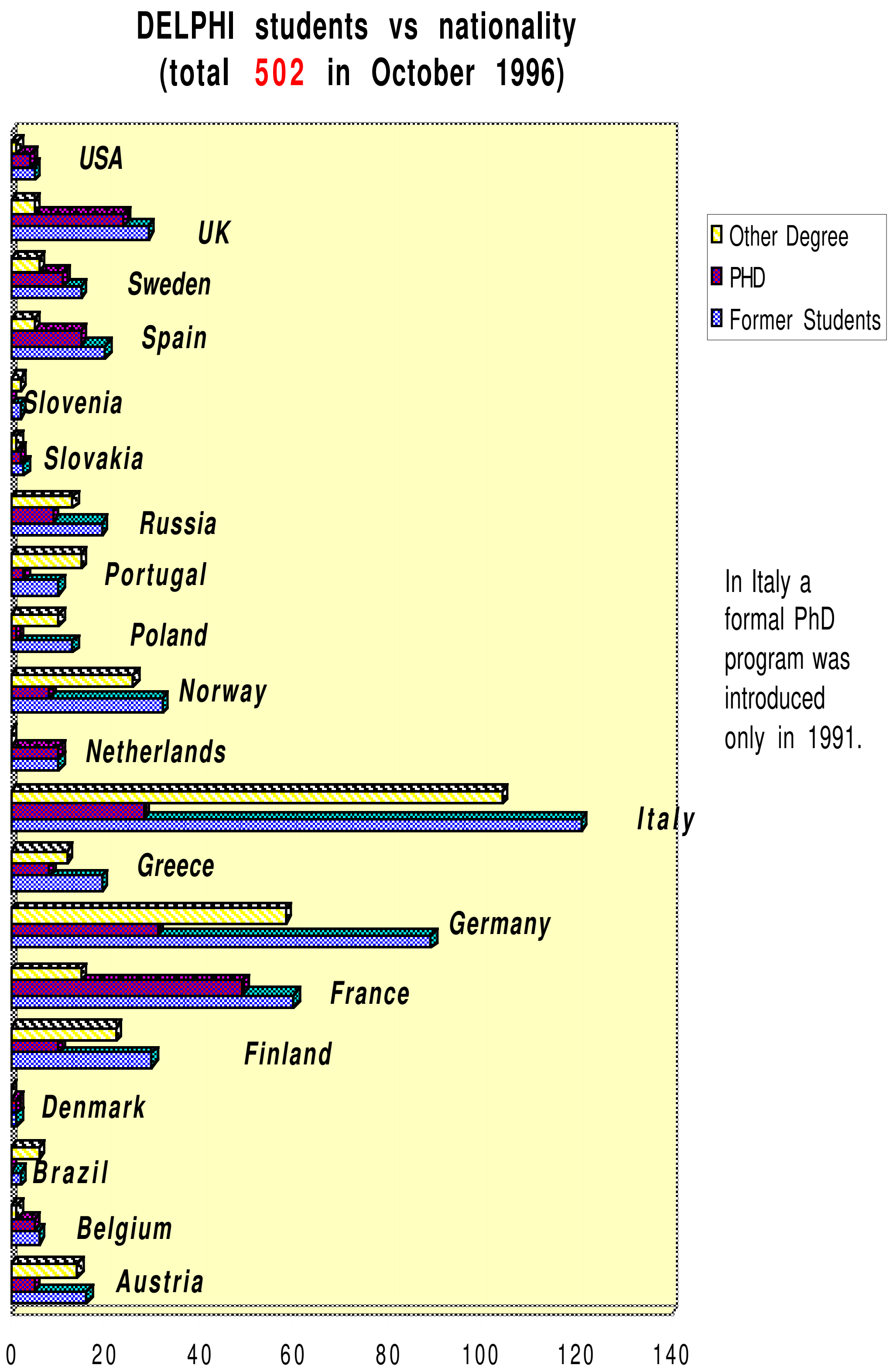
The overall statistics about research destinations is further biased by the fact that in DELPHI we integrate over 20 different nationalities. The typical motivation which lead a student to perform his thesis work in a high energy physics experiment can be very different for the various countries: in certain countries choosing to join a doctoral programme in fundamental research implies a choice/selection which can lead only to a research job.
In countries like Germany or Italy, for example, the situation is much more open. A degree in our field can be an asset for a variety of jobs where the skills acquired during the thesis job are more important than the thesis topic itself.
To be able to judge all of this quantitatively, one would need means of investigation (and time) much more powerful than the one at my disposal, so on this important point I can only be qualitative and all of the above occupational probabilities have to be interpreted having in mind that it typically reflects the *first employment*.

The six distributions that follow describe:

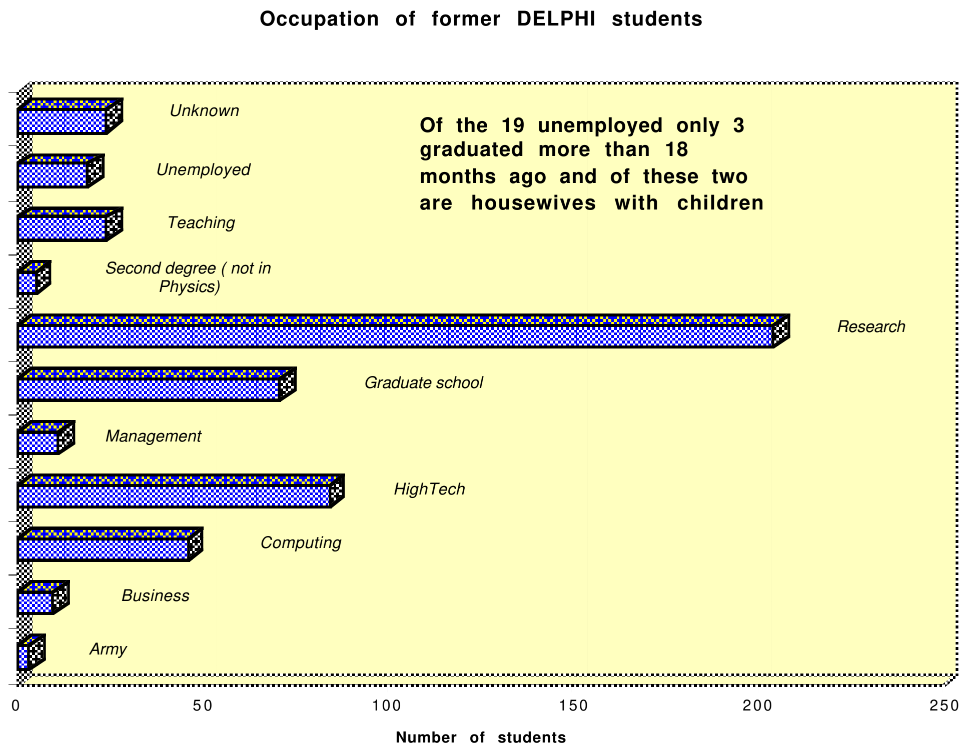
1. The time distribution of the degrees within DELPHI;



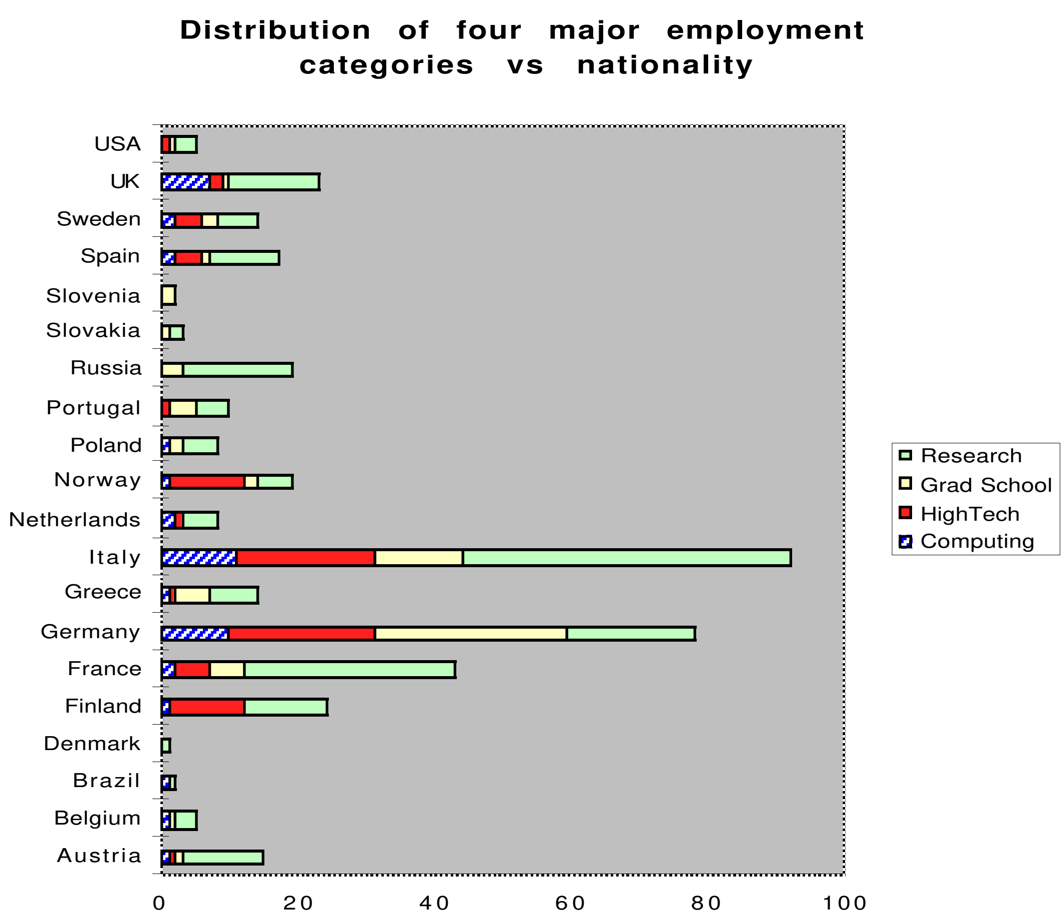
2. The distribution with respect of nationality;



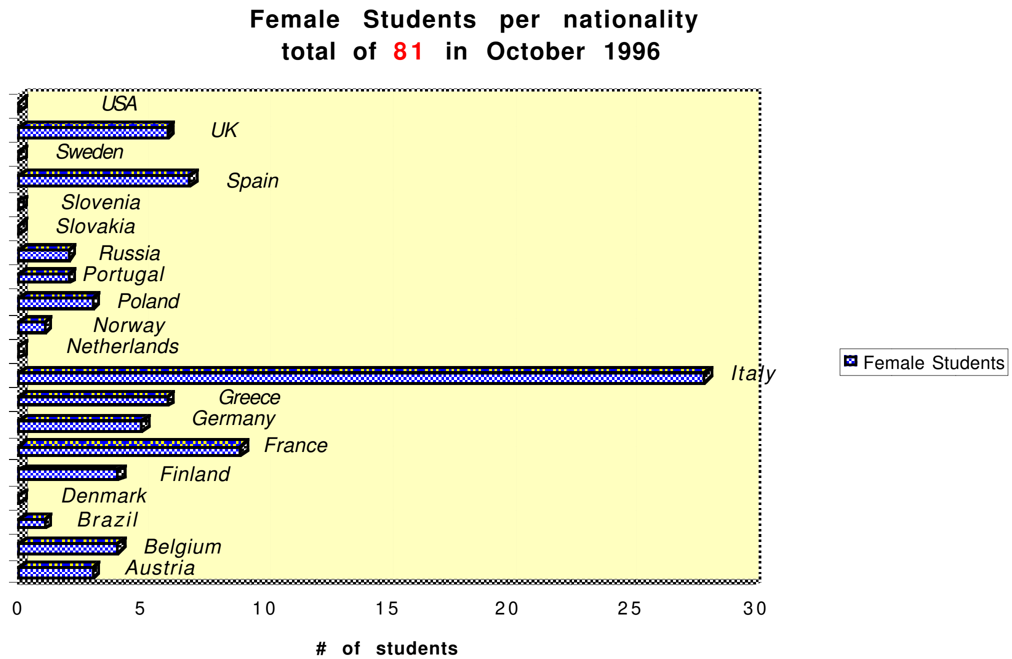
3. The distribution with respect of occupation after the degree;



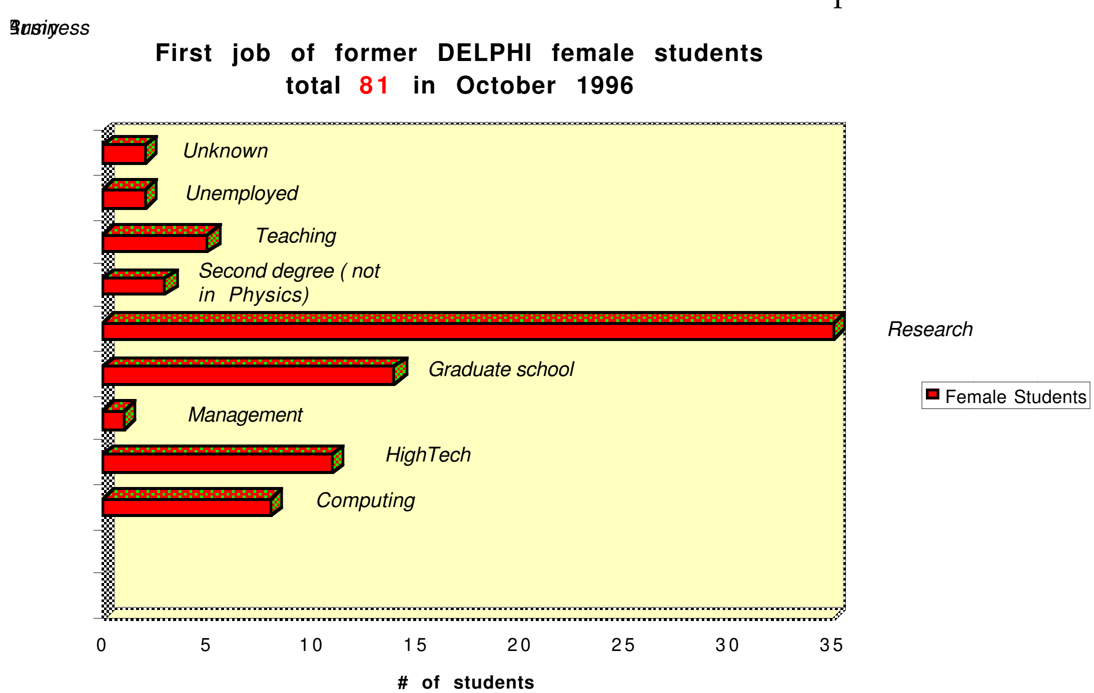
4. The breakdown of the major employment categories with respect to nationality.



5 The distribution of female students versus nationality



6 The distribution of female students versus first occupation



3. <u>Acknowledgements</u>

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