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**DIFFERENCES IN IQ PREDICT ITALIAN NORTH-SOUTH DIFFERENCES
IN (AMONG OTHER THINGS) INCOME: A COMMENT**

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**Differences in IQ predict Italian North-South differences in
(among other things) income: a comment.**

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Abstract. I provide a discourse on the article by Prof. Lynn (2010), which suggests that differences in intelligence explain per capita income levels across the Italian regions. To emphasize that his article is affected by flaws leading to false conclusions. This is clear as soon as some basic principles underpinning any rigorous scientific analysis are employed to discuss his findings.

Keywords: IQ, Income, Education, Italy.

♦ Thanks are due to Gilberto Turati (University of Turin) for comments.

Introduction

The article by Professor Lynn (2010), ‘In Italy, north–south differences in IQ predict differences in income, education, infant mortality, stature, and literacy’, has stimulated a heated debate in the Italian press. I surmise that many scholars were not able to follow the debate, I believe that it is worth reporting its main (and unanimous) conclusion: views such as those expressed by Professor Lynn foster racism and discrimination¹.

Indeed, based on his analysis, from now on an employer, imperfectly informed about the characteristics of the individuals applying for a job, should prefer natives of the north of Italy, because, on average, as suggested by Professor Lynn’s work, both their IQ and productivity are higher for genetic reasons; moreover, that any native of the north of Italy would do better to breed with individuals native of the north as well, so as not to lower her offsprings’ expected IQ. These are just some of the scratchy implications that can be drawn from his work. These implications could without difficulty inspire policy suggestions for any government whose aim would be that of improving the purity of the race, something that Europe dramatically experienced some decades ago.

Clearly, Professor Lynn may argue that it is not his fault if things are so. He is a scientist, and uncomfortable conclusions are not necessarily wrong. This is why I believe that it is necessary to oppose his analysis with rational

¹ Articles about his work appeared on the 17th of February 2010 in the most important Italian newspapers (e.g. Il Corriere della Sera, La Stampa, La Repubblica).

arguments, showing that it is affected by flaws leading to false conclusions. This is clear as soon as some basic principles underpinning any reliable scientific work are employed to discuss his findings.

This paper is organized as follows. In Section 2 I summarize the article by Professor Lynn and discuss some of the controversial points. In Section 3 I point out the biggest methodological mistake made by Professor Lynn, that of confusing correlation with causation. In Section 4 I emphasize more plausible explanations for the pattern we observe in the data. Section 5 briefly concludes.

2. The fantasy world of Professor Lynn

The hypothesis of Professor Lynn is that regional differences in intelligence are the major factor responsible for the (well-known) regional differences in Italy. He argues that this hypothesis is derived from the extensive research showing a positive correlation between intelligence and income. As intelligence is mainly due to genetic factors, he goes on to say that, these are ultimately responsible for income differences among individuals, groups and regions.

In support of this hypothesis, Professor Lynn quotes several studies pointing out some correlation between IQ and income at the individual level. The first observation that can be made is that the (well-known) correlation between IQs and earnings is perhaps accepted by him too

readily, without any discussion which is worth mentioning; this is coupled with a surprising unawareness that studies on siblings pairs alone cannot be considered an unquestioned control for those factors affecting both IQ and income.

In support of the hypothesis, that there exists a positive correlation between IQ and per capita income, which can also explain regional differences within a country, Professor Lynn quotes some previous studies on the subject. To understand the premises from which he moves, it is enlightening to have a look at some of the findings he mentions, concerning both the distribution of IQ in American States and the correlation between IQ and a measure of per capita income therein. Despite this, correlation is very weak ($r = 0.28$) this is not seen as an impediment to conclude that differences in IQ (and hence in per capita income) are due to the uneven distribution of Blacks and Hispanics in American States, who, according to Professor Lynn, have lower average IQ than Europeans: a view that is at least lacking of any serious empirical support.

The main focus of his article is however Italy. Professor Lynn aims to present evidence in support of the following hypotheses: IQs in Italy are higher in the north than in the south; these IQ differences explain most of the per capita income differences; regional IQ differences in Italy are evident in the differences in stature, infant mortality, literacy and years of education.

As for the methodology employed, IQs are calculated for Italy based on data drawn from the OECD Program for International Student Assessment – PISA (OECD, 2007), which assesses some of the basic skills, such as reading comprehension, acquired by students near the end of compulsory education. The IQ for the Italian regions is calculated averaging the scores on reading comprehension, mathematical ability and scientific understanding, and then expressed in standard deviation units in relation to the British mean. According to the data, natives of the North of Italy will be happy to know that, on average, they are as clever as British people; natives of the South of Italy will be likely upset by this piece of scientific evidence pointing out their neuronal backwardness (with respect to British people, of course). On average, individuals living in *Friuli Venezia Giulia*, a region located on the extreme North, display an IQ of 103 (British mean IQ = 100) which is substantially higher than that exhibited, on average, by individuals living in a region like *Sicilia* (IQ = 89), located in the extreme South.

As for the hypothesis that the north-south gradient of IQs in Italy explains the differences in economic development, Professor Lynn reports that a correlation of 0.937 is found between IQs obtained from PISA data (collected in 2006) and per capita income (relative to 2003). This is the basis to state, without any doubt, that IQ differences explain 88% of the variance in per capita incomes across Italian regions. Professor Lynn admits that IQs (in 2006) are highly correlated with the years of education of adults

(in 1951), although he neglects the importance of this uncomfortable evidence, stating that regional differences in years of schooling do not account for much of the difference in IQs levels among regions.

Table 3 (p. 98) of the article under scrutiny, reports the number of significant figures in science, born in the Italian regions over the centuries (drawn from Murray, 2003). Given that the greatest number of significant figures have come from the north, according to Professor Lynn, this would constitute compelling evidence that the north-south gradient in Italy has been present since 1400!

To be fair, Professor Lynn quotes a passage from Murray (2003) in which a more plausible explanation for the difference in the number of significant figures, during for example the *Renaissance*, it is reported; this passage emphasizes the responsibilities of the political regime which kept the South culturally separated from the rest of Europe². But Professor Lynn insists that this cannot be a persuasive explanation: the lack of significant figures from southern Italy is that the IQ was lower. What evidence does he present for such a conclusion? None. A native of the south *must be* less intelligent, for the simple reason that unlike individuals living in the northern regions, their genetic pool has been polluted, during several centuries of colonization, by genes carried by African (and middle-eastern) hosts. As Professor Lynn writes (p. 99): “The diffusion of genes from the

² Personally I do not agree with the reliability of a category such as that of *significant figures* to draw any general conclusion.

Near East and North Africa may explain why the populations of southern Italy have IQs in the range 89-92, intermediate between those of northern Italy and central and northern Europe (about 100) and those of the Near East and North Africa (in the range of 80-84)". Again: what is the evidence in support of Professor Lynn's statement that differences in IQ are in fact due to genetic reasons? None. He just provides arguments which are as follows: as there is evidence of genetic similarities between some Mediterranean populations whose members perform equally well in score tests which are a reliable measure of IQ, it must be the case that a person's score test is entirely determined by his/her genotype!

It is worth mentioning that the available evidence suggests that the genetic transmission of IQ appears to be relatively unimportant to explain the intergenerational transmission of economic success. As far as the inheritance of economic status is concerned, IQ is not a major contributor, and the genetic transmission of IQ is even less important (Bowles and Gintis, 2002; Bowles, Gintis and Osborne, 2005).

3. Professor Lynn's biggest mistake

There are very good reasons to believe that the analysis carried out by Professor Lynn is highly inadequate and leads to false conclusions. Here I discuss his biggest methodological mistake. I am confident that there is

more than enough evidence to convince anyone that Professor Lynn's assertions lack any scientific soundness.

A crucial point which makes the results of Professor Lynn unreliable, is that he apparently does not make the distinction between correlation and causation. In his article, he just presents a correlation matrix showing surprisingly high level of correlation among the variables. However, any statistician would have grounds to argue that these results are very likely to be biased, given the highly inadequate size of the sample. The number of observations equals twelve, which is far from what can be considered an adequate number; with this sample, also the significance levels do not say much about the reliability of the correlations.

In any case, correlation is not causation. As the Nobel laureate James Heckman has pointed out in a more general context (Heckman, 2000, p. 47): "...an important contribution of econometric thought was the formalization of the notion developed in philosophy that many different theoretical models...may be consistent with the same data...this is called the problem of identification....It makes precise the idea that *correlation is not causation*... The key insight in the literature of twentieth century econometrics was the discovery of the *conditional nature* of empirical knowledge".

I believe that this is the most serious shortcoming of Professor Lynn's work. The very fact that two variables exhibit a similar pattern of variation

does not say much. Changes in the first variable could produce changes in the other, or the reverse could be true. There is however the possibility that changes in the variables of interest are produced by changes in some other unobserved variables. This possibility is usually taken very seriously one by any scientist engaged in the explanation of either natural or social phenomena. The simplistic analysis carried out by Professor Lynn - from which he pretends to draw substantial conclusions about the genotypic variation among Italians and the way in which this variation affects income levels - simply neglects this point.

To see how misleading it could be to infer conclusions from a simple correlation analysis, I think that the following passage drawn from Bowles, Gintis and Osborne (2005, p. 13) is worth stating: “Consider the case of South Africa, where in 1993...roughly two-thirds of the intergenerational transmission of earnings was attributable to the fact that fathers and sons are of the same race... Because the traits designated by *race* are highly heritable...we thus find a substantial role of genetic inheritance in the intergenerational transmission of economic status. Yet, it is especially clear in the case of South Africa under apartheid that the economic importance of the genetic inheritance of physical traits derived from environmental influences. What made the genetic inheritance of skin color and other racial markers central to the transmission process were matters of public

policy....racial patterns in marriage and the discrimination suffered by nonwhites”.

4. More plausible explanations

Many authors suggest to interpret a test score as a measure of cognitive performance rather than as a measure of cognitive skills, as personality may influence performance with measurable effects on the IQ (Eysenck, 1994). Among other things, also a stimulating environment might play a role in giving a person the right incentives to perform well in a test. We would expect better results were a more stimulating environment is provided, which is also (although not only) a matter of resources employed. I return to this point below.

There is extensive evidence of a positive and statistically significant impact of expenditure in education on economic growth. This result is robust to the introduction of controls for institutional factors, and suggests that availability of resources for education affects GDP growth rates by enhancing people’s productivity (e.g. Beraldo et al., 2009). Not surprisingly, those studies which have seriously investigated the question of the uneven distribution of student’s skills over the Italian regions, find that the unbalanced distribution of economic resources plays a major role (Bettoni and Asquini, 2002; Bratti et al., 2007, 2008): as far as Italian regions are concerned, the per capita expenditure in education is sensibly

higher where better results are achieved by students in score tests (for example, regions such as *Trentino Alto Adige*, exhibit a substantially higher expenditure in education per student)³. Moreover, data from the Italian Ministry of education, shows that the distribution of resources is even more unequal concerning capital expenditure. Bratti et al. (2006, 2008) have estimated that as far as capital expenditure is concerned, the available resources per student in *Friuli Venezia Giulia*'s provinces are many times higher than in *Sicilia* (up to twenty times). In their study, which relies on multiple regression analysis, production functions aimed at assessing the size and the determinants of territorial differences in student performance are estimated. A highly significant positive correlation between the educational expenditure on capital account and student performance is observed. This result highlights the important role of schooling infrastructures. By contrast, the estimates show a negative and significant correlation between performance and expenditure in intermediate consumption and payments to teachers (the type of expenditures more common in the South of Italy, for reasons, mainly political and context-dependent, whose discussion would go beyond the scope of the present paper). Both effects are robust across specifications and are in agreement with the scientific literature on the subject. Moreover, Bratti et al. (2006, 2008) find a significant impact of the labour market conditions on student

³ Expenditure in education per student across Italian regions can be computed by using data made available by the Italian statistical office (See ISTAT, 2009a, 2009b).

performance, which suggests that the worse the conditions of the labour market are, the less are the incentives to invest in education, for the simple reason that individuals rationally choose to devote more time to alternative activities (given the low expected return of investing in education). This evidence is particularly important in the light of the difference, mentioned above, between cognitive performance and cognitive skills. As Bowles and Gintis (2002) point out, since taking a test is like doing a job, successful performance is likely the result from a combination of ability and motivation⁴.

4. Conclusion

Philosophy originated in ancient Greece to set people free from the power of myths. This is the same task that modern science has primarily undertaken. In order for this task to be reliably accomplished, scientific work has to be consistent with a set of rules which are thought to reduce the risk of promoting fallacies. I believe that Professor Lynn (2010)'s work is not consistent with some of these basic rules, whose respect is a necessary condition for real progress in knowledge.

⁴ Notice furthermore that Bratti et al. (2006, 2008) observed a positive correlation of students performance with household's economic capital, proxied by an index of home possession and by parents' highest occupational status. This result is in line with the insights provided by simple correlation exercises. To give an example, for the OECD countries, the correlation coefficient between the variable "Total variance in student performance in reading literacy" and the variable "Difference between top and bottom quarter of Index of socio-economic status" (ISEI), both available from the PISA dataset, are very highly correlated (correlation coefficient of 0.65, my calculation).

References

- Beraldo, S., Montolio, D., Turati, G., (2009). Healthy, educated and wealthy: a primer on the impact of public and private welfare expenditures on economic growth. *The Journal of Socio-Economics*, 38, 946-956.
- Bettoni, C., Asquini, G., (2002). La spesa pubblica per istruzione e cultura in Italia: i principali indicatori. National Institute for the assessment of the educational system, Rome.
- Bowles, S., Gintis, H., (2002). The inheritance of inequality. *Journal of Economic Perspectives*, 16 (3), 3-30.
- Bowles, S., Gintis, H., Osborne, M., (2005). *Unequal chances: family background and economic success*. Princeton: Princeton University Press.
- Bratti, M. Checchi, D., Filippin, A., (2007). Territorial differences in Italian Students' Mathematical Competencies: Evidence from PISA 2003. IZA DP, No. 2603.
- Bratti, M. Checchi, D., Filippin, A., (2008). *Da dove vengono le competenze degli studenti?* Bologna: Il Mulino.
- Eysenck, H. J., (1994). Intelligence and Introversion-Extraversion. In Sternberg, R.J., Ruzgis, P., (eds.) *Personality and Intelligence*. Cambridge University Press, Cambridge, 3-31.

- Heckman, J. J., (2000). Causal Parameters and Policy Analysis in Economics: A Twentieth Century Retrospective. *Quarterly Journal of Economics*, 115 (1), 45–97.
- ISTAT, (2009a). *Conti economici regionali*. Rome: The National Institute of Statistics.
- ISTAT, (2009b). *Annuario statistico italiano*. Rome: The National Institute of Statistics.
- Lynn, R., (2010). In Italy, north-south differences in IQ predict differences in income, education, infant mortality, stature, and literacy. *Intelligence*, 38, 93-100.
- Murray, C., (2003). *Human accomplishment. The pursuit of excellence in the arts and sciences*. New York: HarperCollins Publishers Inc.
- OECD, (2007), *PISA 2006 competencies for tomorrow's world*. Paris: OECD.