The educational arms race

What peacocks and humans have in common

The handicap that came in handy

I’m sure that already now you wonder where I’m going with this. Could peacocks have any relevance in an article about education? Things will get weirder, however, when I mix in some economics and some game theory as well. But if you are a little patient, you will see how all this relates.

In evolutionary science, the colourful tail and plumage of the peacock exemplifies the handicap theory, which was originally proposed by Amotz Zahavi. According to the handicap theory, an individual that can afford to be conspicuous before the eyes of predators must have good genes to have so survived so far. Drab peacocks may have equally good genes, and they may not. A peahen that happens to pick a drab male with good genes will have the best chances of bringing up healthy peachicks that can produce healthy peachicks themselves (because these chicks are likely to have inherited the good genes, and they don’t attract predators either). However, the peahen cannot necessarily pick the drab peacock with the good genes. The male will somehow have to signal his good genes. So the drab, healthy peacock may give his chicks good chances of surviving, but he will not necessarily reproduce a lot, since peahens are no more likely to pick him than his drab competitors. On the other hand, if a peahen is attracted to the colourful peacock, she will “know” that he has good genes (we’re talking instincts here, and I use “know” for convenience only). The chances of bringing up healthy, surviving, chicks will be increased by the otherwise good genes, but this will be offset by the side effect of attracting predators. For the peacock chicks that is. The peahen chicks will only reap the benefits, and that means that they are more likely to propagate in the next generation. These peahen chicks are likely to be bearers of their mother’s predisposition for colourful mating partners as well as the gene that codes for a colourful tail and plumage in male offspring. In the next generations, colourful peacocks and peahens who fancy them will propagate hand in hand (or wing in wing if you like).

You have likely heard of “survival of the species”, but as you might deduce, the above example (and plenty others) have long time ago dismissed the species as an objective of evolution. Peafowls would be better off as a species, if the signal of good genes would bring along less danger. In fact, most animal signals are less dangerous, such as size, quality of teeth, high age and so forth. But sometimes there are other more subtle signals at stake; signals that increase the propagation of the individual’s genes, but which do certainly not benefit the group or the species as a whole.

Young men are genetically predisposed for stupidity

Taking risks is one such signal. Young men do it all the time. Advertently or inadvertently, this risk taking behaviour works as a signal to young women that a fit and agile individual has sufficiently good genes to survive anyway, and/or that he is likely to take risks on her behalf as well. To the risk taking individual, it is all about chances of propagation. To put it in more formal terms: boldness pays off when it increases the chances of (long term) propagation more than it decreases the chances of propagation due to death or injury. The winner doesn’t always take it all, but he certainly takes a lot, and other males, who don’t follow-suit, risk not propagating at all. Eventually, the best strategy for all males is to take risks, in different proportions though, according to their own relative fitness (technically, they will all have different “trade-off curves”). Altogether, the whole group of risk taking males will not mate more than a hypothetical group in a neighbouring area, where the males do not take risks. But more of them will die young. You might recognize this as another case of the famous “prisoner’s dilemma”, where the best overall outcome would be if you could agree not to take risks. But you as an individual are better off taking risks, regardless of the conduct of your competitors (you might also recognize this as a reason for governmental laws aimed at protecting people who depend a little too much on their reptilian part of the brain). For animals, the competition among males leads in the long run to propagating “strong” genes. For humans, we are already in deep when it comes to protecting “weak” genes, and I’m sure that most us (extreme liberals apart) would agree that sometimes we people just need to be protected from ourselves.
**Table 1: A game of “prisoner’s dilemma”**

<table>
<thead>
<tr>
<th>Chances of reproduction</th>
<th>You take (appropriate) risks</th>
<th>You don’t take risks</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Your competitors take (appropriate) risks</strong></td>
<td>Medium</td>
<td>Low</td>
</tr>
<tr>
<td><strong>Your competitors don’t take risks</strong></td>
<td>Very High</td>
<td>High</td>
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**Displaying your feathers also works in the job market**

**When education becomes your handy handicap**

Maybe your company employs five book keepers. Now, let’s say that one of these book keepers becomes “taxation specialist”. All five book keepers have the prerequisites for acquiring such expertise, but the company needs just one and invests time and money in his skillset going forward (I write “his” and not “her”, because taxation is more likely to be a breath-taking subject to certain (lonely) men). Now, invested costs are sunk costs, but if the specialist resigns, the company will have to invest time and money all over again. The company now has an incentive to make his salary higher than the salary of his colleagues in order to keep him. The same thing happens in other companies, so this company will have to match similar salary levels, if they hire a specialist from another company. This explains in part why equally suitable people in the same line of business do not see full salary arbitration. Economists will recognize this as an application of *efficiency wages* (textbooks are written on that subject, but if you want to learn the short version then see Table 2). Another explanation is that employers never really know whether two people are equally suitable and estimate their relative productivity to differ. We all rely on *signals*, in particular if you’re fresh out of school and without many merits in the job market.

**Table 2: Efficiency wages**
Economic theory predicts that wages and salaries will reflect the marginal productivity of the last worker (for convenience, “wages” refers to both wages and salaries). When a company makes profits on each employee, they will have an incentive to hire more people, which will raise wages until the point where the “last man” yields zero profit. There are situations, however, where a company can earn higher profits by raising wages, as:

- workers may become more motivated
- better workers might be attracted to the company
- current workers become more loyal, resulting in less employee turnover

In fact, this is one of the causes of structural unemployment, where more workers are willing to work at market rates and even below, but companies do not hire more people at the going (high) wages, as this would reduce their profits. Likewise, individual companies do not want to lower the wages to clear the market, as the loss in productivity will also result in reduced profits.

In the graph on the left hand side you can see that labour demand decreases from the equilibrium point (the black dotted line) in situations where the wage level increases or decreases.

Education is one such signal. A Master’s degree proves that you have a certain level of discipline and intelligence (or really know how to kiss ass, which is not necessarily an undesirable thing in business either...). This means that you reduce the uncertainty about your competencies in the eyes of an employer. If you get the higher paying job, and the company invests in you, then you’re off for a good start. And a good start is the best insurance of a good continuation; that’s one of the key characteristics of the competitive job market. So altogether, in a lifetime it probably pays off for you to complete an education.

But will the society also benefit from your education? Well, it might be that your education is indeed very useful for the society. It might very well be that education raises your productivity. It might also be that it doesn’t. But if it does, then for society to benefit, this increase in productivity must be higher than the value of the work you’re not doing while you spend 6 years in university plus the tax funded cost of your education. And your skills must be notably higher than they would have been, had you spent these 6 years learning on the job, earning money and paying taxes.

Have patience; we’re getting there, and maybe you guessed it already from the example of the taxation specialist: For the individual it is not just the productivity that makes the difference, but largely the relative competitive position you gain in the job market due to the signal value of your education. To illustrate, I will use another version of the prisoner’s dilemma. Here, we use two individuals; you and your competitor. In this example your productivity increase from completing an education does not even pay back your own share of education costs (including lost income). The two of your compete for the job as a specialist. When you have the same prerequisites (either none of you go to university, or both of you do), you will each have 50% chance of getting the good job. If one of you goes to university and the other one doesn’t, the educated person will get the good job.
Table 3: Another game of "prisoner's dilemma"

<table>
<thead>
<tr>
<th>Your lifetime &quot;product&quot; (value of work minus cost of education)</th>
<th>You complete higher education</th>
<th>You don’t complete higher education</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Your competitor completes higher education</strong></td>
<td>Medium (on average, assuming 50% chance of getting the higher paying job)</td>
<td>LOW (he gets the good job)</td>
</tr>
<tr>
<td><strong>Your competitor doesn’t complete higher education</strong></td>
<td>Very High (you get the good job)</td>
<td>High (on average, assuming 50% chance of getting the higher paying job)</td>
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Whether your competitor chooses to educate himself or not doesn’t change your best choice. In both cases, you will be better off even when you handicap yourself in terms of lifetime productivity.

**More education is not always good business**

OK, I’m on sacred ground now; and a shaky one too. I am by no means arguing that all education is without substance. I wouldn’t want my MD to be self-taught, and there are many other examples, where education is absolutely essential. But there are also many other examples, where stuff you learn in school is used invariably. Maybe you work in a completely different field, maybe you work with a narrow subject and never use much of what you learned, or maybe what you learned was just utterly useless.

I admit to be prejudiced when it comes to certain types of theoretical education. I will leave you to your own prejudices, however, and you might have fun looking at this table (based on Danmarks Statistik) showing the composition of Danish full time students on long and medium long types of education in October 2011 (phD, MSc, Ba, "medium long" non-Ba). On top of these numbers come students from all applied learning, short term and part time education, as well as primary and secondary schools.

Table 4: Long term and medium term students

Some of these types of education are directly asked for by businesses or society. Other kinds of education are indirectly asked for, when businesses choose to employ or promote academics. Of the indirect demand, some comes from employees rather than employers, who in turn often see education
as a popular employee benefit. And some part of the demand stems from the fact that employers with a particular background tend to favour employees with the same background, for reasons other than real business needs (rather this could be explained by existing network, loyalty concerns or pure megalomania).

In Denmark, we often hear politicians cry about the impact of education on GDP. These arguments are often based on studies of salary differences between people with different levels of education. However, the company from the first example in this text still needs just one tax specialist. And society can only use (efficiently) a certain number of lawyers, communication specialists and chartered accountants. As I hope to have convinced you of by now; the difference in salaries between educational groups largely reflects the relative competitive position people in-between. To put it in other words, as more soldiers join the conquest, each soldier gets a smaller share of the loot. In addition to this (I hope I’m not the one breaking the news); people are different. We don’t have the same prerequisites, such as mental capacity or raw IQ. You can say that there will be diminishing returns to higher education. To get many more people through an MSc in Physics would require that we lower the bar quite a bit. I would like to think that I would be able to get by and pass, but I can guarantee you that I would not deliver the cold fusion afterwards. To put in other words, and speaking in general terms: Most of the best brains are already in use.

**Final Remarks**

We need to be very careful when politicians preach more education, and when they factor productivity increases into their election programmes. We should stand guard that the targets of getting more people through some non-practical types of education do not lead to hollowing out (relevant) curricula or lowering the bar to pass. And we might need to rethink the whole educational setup. I don’t have the solution to what to do. I have some ideas, and you might have some ideas. But before talking solutions, we need to “see the same elephant”. If education is not put in the real perspective, the debate will continue on the wrong track.