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Making the most of ourselves in the 21st century**

State-of-Science Review: SR-A I I
The Economic Importance of Social Skills:
A Short (and Selective) Survey of Recent Research

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Summary

Each of us is endowed with a unique set of skills that we use in all aspects of our everyday life. If we were asked to name the skills that we thought were valuable, we would find ourselves enumerating a never-ending list of attributes. Nevertheless, when describing the determinants of socio-economic outcomes – or even the learning process – economists often have a very simplified view of skill. Our failure to take into account the fact that skill is intrinsically a multidimensional object is not only nonsensical, but also misguides both our research and the design of social policy. The study of the importance of social skills for an individual's life has grown substantially among economists in recent years. This short survey summarises some of the most recent papers on this topic. It is not meant to be an exhaustive survey of the literature, but one that provides a sample of representative work in this area. In most of the papers we describe, especially those written by economists, 'social skills' are given a broad definition, and are often called 'non-cognitive' skills. The emphasis in these papers is in the role of skills or abilities not usually emphasised by economists, such as a score in a cognitive achievement test (for example, an IQ test, or a maths and reading test). Nevertheless, some of the papers we review attempt to distinguish different types of non-cognitive skills. As expected, social skills are found to be very important. They are strong determinants of employment, work experience, and wages. They are also significant determinants of schooling outcomes. Finally, they are shown to be strongly correlated with engagement in a variety of risky behaviours, such as smoking, teenage pregnancy, and crime. In the rest of this paper we elaborate on each of these topics.

1. Why non-cognitive skills are important

One of the most striking examples of the importance of non-cognitive skills is provided by Heckman, Hsee and Rubinstein's (2000) study of the General Educational Development (GED) programme in the US. High school dropouts in the US (individuals who stop attending high school before having enough credits for a high school diploma) have the opportunity of achieving high school certification by taking the GED exam. However, it was observed by Cameron and Heckman (1993) that GED recipients earned much lower wages than regular high school graduates, even though their degrees were supposed to be equivalent to a high school diploma. Heckman, Hsee and Rubinstein (2000) show that GED recipients not only have an equivalent to a high school degree, but they are also as able in terms of cognitive ability as regular high school graduates (who do not go on to college). Therefore, GED recipients are individuals with the same level of cognitive ability and educational achievement as high school graduates, but they are paid much less in the labour market. In fact, controlling for cognitive skill, job training and years of schooling, they have even lower wages than high school dropouts without a GED degree!

Heckman, Hsee and Rubinstein (2000) go on to investigate why this may be happening: what is wrong with GED recipients? They find that GED recipients are much more likely to exhibit delinquent behaviours in their adolescence (such as skipping school, getting into fights, or engaging in crime) than either high school graduates or high school dropouts. They are also less likely to be able to hold down a job as adults. In summary, GED recipients are relatively qualified and intelligent individuals who lack skills such as discipline, patience or motivation, and as a result they are penalised in the labour market. The inadequate social skills that prevent them from doing well in employment were probably behind their decision to drop out of school in the first place.

In another paper, Heckman, Urzua and Sixtrud (2006) provide direct evidence of the importance of non-cognitive skills by modelling labour market outcomes as functions of measures of self-esteem and locus of control. They show that these variables strongly affect employment, work experience, occupation,

and wages. Thus, if one moves an individual from the 25th to the 75th percentile of the non-cognitive skill distribution, wages improve by about 10% for males, and 40% for females. As a comparison, a similar movement in the cognitive skill distribution leads to an increase of about 20% in male wages, and 30% in female wages. Once they control for schooling, they generally find that wages exhibit a stronger gradient with non-cognitive skills than with cognitive skills. In terms of employment probabilities, moving a male up in the non-cognitive skill distribution as described above increases the probability of employment at age 30 by 15%. Effects on work experience are equally important.

Another interesting paper, by Kuhn and Weinberger (2005), finds that males who occupied leadership positions in high school earn 4%-33% higher wages as adults. Duncan and Dunifon (1998) show that several measures of motivational traits are good predictors of wages. Bowles, Gintis and Osborne (2001) provide a comprehensive survey of the literature reporting on several studies which find large effects of what they call psychological variables on earnings. Osborne-Groves (2005) shows that personality measures predict labour market outcomes.

2. UK perspective

For the UK, we focus on three papers. First, Feinstein (2000) uses the British Cohort Study (BCS) to document the economic importance of behavioural and psychological attributes of children measured by age 10. In his paper, going from the 20th to the 80th percentile of the distribution of anti-social disorder increases the probability that one experiences an episode of unemployment longer than four months by 6% for boys. Similarly, an increase from the 20th to the 80th percentile of the self-esteem distribution is associated with an increase in earnings of 5.6% for boys. For girls, the self-esteem variable is not significantly important in predicting wages, but locus of control and other behavioural scores have strong effects: moving up the distribution of these skills as described above leads to increases in wages of 6.3% and 5% respectively.

Carneiro, Crawford and Goodman (2007) provide a similar analysis using the National Child Development Survey (NCDS). Their measure of non-cognitive skills is the score on the British Social Adjustment Guide (BSAG) at age 11 (they also use measures of this skill taken at age seven). They find that a one standard deviation increase in social skills ('social maladjustment', as they call it) at age 11 increases the probability of being employed at age 42 by 2.5% on average. The model the authors estimate allows cognitive and non-cognitive skills to interact in the production of labour market outcomes, so that the estimate reported above varies considerably for individuals with different levels of cognitive skills: it can be as low as 0 for individuals with very high levels of cognitive skills (two standard deviations above the mean), or as high as 4.5% for those with low levels of cognitive skills (two standard deviations below the mean).

The effects of cognitive and non-cognitive skills are surprisingly different whether one does or does not control for schooling: they are quite strong without schooling controls, but they virtually disappear once one includes this variable as a control. This suggests that the effect of cognitive and non-cognitive skills on wages comes mostly through their impact on educational attainment. In particular, the researchers find that the effect of one standard deviation increase in social skills at age 11 is an increase of 3.3% in average earnings at 42, although this effect can be as low as 0% for those with low cognitive skills, or as high as 7% for those with high cognition. It is puzzling, but interesting, that cognitive and non-cognitive skills seem to be substitutes in the production of employment, but complements in the production of earnings (given that the individual is employed).

One weakness of the procedure the authors employ is that they do not have an exogenous source of variation to identify the effect of schooling on earnings (as emphasized by Heckman, Sixtrud and Urzua, 2006), and rely instead on the fact that the NCDS is a rich enough dataset so that, after controlling for a very large set of variables, individuals with high and low levels of schooling are very similar (apart from their

choice of schooling). Nevertheless, they conjecture that this potential problem affects their conclusions very much.

The third paper worthy of mention in terms of the UK is by Blanden, Gregg and MacMillan (2006). They argue that non-cognitive variables are important determinants of the degree of intergenerational transmission of income but, as emphasised also in Carneiro, Crawford and Goodman (2007), much of this effect is related with the effect of non-cognitive skills on schooling, rather with their direct effect on earnings.

3. Social skills and attainment

Given the findings in these papers, it is natural that this review proceeds to discuss the role of social skills in promoting educational attainment. On this topic, we start with a few selective examples from outside economics. Duckworth and Seligman (2005) and Duckworth et al. (2007) are two fascinating examples. The first paper shows that self-discipline outdoes IQ as a predictor of the academic performance of adolescents. Self-discipline measured in the Fall accounts for twice as much variance as IQ in explaining final grades. The study is very careful in measuring self-discipline, presenting several alternative measures. Furthermore, it was conducted on two different samples with very similar results.

The second study examines the relationship between perseverance and long-term goals, again looking at different datasets. The main results are that perseverance accounts, on average, for 4% of the variance of outcomes such as educational attainment among adults, university marks among students in elite universities, performance in military school, and performance in spelling bees. Surprisingly, the authors find that perseverance is not related with IQ. Heckman, Sixtrud and Urzua (2006) report a similar result. In their sample, you cannot reject that the correlation between cognitive and non-cognitive skills is equal to zero. However, this is not true in the study of Carneiro, Crawford and Goodman (2007).

Research by Duncan et al. (2006) focuses on school readiness measured at school entry and later educational achievement. This paper is remarkable in examining in a uniform way six different longitudinal studies of children, that cover the UK, the US, and Canada. It reports that, across the six studies, the best predictors of educational achievement at school entry are maths and reading scores, and attention skills. Other measures of socio-emotional behaviours at school entry had limited power in explaining educational success.

The two studies described earlier, by Heckman, Sixtrud and Urzua (2006), and Carneiro, Crawford and Goodman (2007), also examine this issue. Both find that non-cognitive skills have a very strong impact on educational attainment.

For example, Heckman, Sixtrud and Urzua (2006) show that an increase in the non-cognitive score from the 25th percentile to the 75th percentile of its distribution is associated with a 30% increase in the probability of graduating from a four-year college. Similarly, Carneiro, Crawford and Goodman (2007) document that, on average, a one standard deviation improvement in social maladjustment leads to a 3.8% increase in the probability of staying on in school after age 16, while a one standard deviation increase in cognition improves the chances of post-compulsory schooling by 21.5%. Again, cognitive and non-cognitive skills are shown to be strong complements in the production of educational attainment, with the productivity of non-cognitive skills increasing with the endowment of cognitive skills and vice versa. The effects of these two types of skills on having a higher education degree at age 42 are equally large, and interact exactly in the same way.

4. Risky behaviours

We end this short and selective review with a focus on risky behaviours of adolescents and adults. Some examples of such behaviours that are usually considered are teenage pregnancy, substance use, and crime. Risky behaviours are of interest for several reasons. First, they are often undesirable on their own right, because they generate large costs to society. Second, they are likely to influence the life of the individuals engaged in such behaviours, preventing them from performing in school or at work, increasing the probability that they spend time in prison or suffer from poor health (for several reasons), or even influencing their chances of forming stable families.

Heckman, Sixtrud and Urzua (2006) show that both cognitive and non-cognitive skills influence smoking by age 18, incarceration, participation in illegal activities, pregnancy by age 18, and marital status. It is important that, for many of these behaviours, non-cognitive skills are much more important than cognitive skills.

Carneiro, Crawford and Goodman (2007) study smoking, truancy, school suspension, participation in criminal activities, and pregnancy – all measured in the teenage years. They show that, on average, a one standard deviation increase in social skills (measured at age 11) reduces the proportion of teenagers smoking by 3%, reduces truancy by 3.6%, reduces exclusion from school by 0.4%, reduces participation in crime by 2.3%, and reduces teenage pregnancies in 2.2%. These effects are large, especially when compared with the means of each variable in the sample, which are, respectively, 13%, 51%, 1.4%, 10.2%, and 12.5%. Cognitive skills are also found to be as important as non-cognitive skills.

The authors then go on to document the relationship between social skills at age 10 and adult participation in crime, adult self-reported health status, and adult mental health (depression and other problems). Again, they find that cognitive and non-cognitive skills are quite important.

5. Varieties of skills

In summary, it is clear that a model of the world where skill is a one-dimensional attribute is extremely inadequate. For the most part, this review groups skill in two categories only, but it is quite likely that a much larger variety of skills is important (see, for example, Duncan et al., 2006; Feinstein, 2000, or the final section in Carneiro, Crawford and Goodman, 2007).

There is now substantial evidence that non-cognitive skills are important determinants of labour market outcomes, both directly and indirectly through their substantial effect on educational attainment. It is particularly striking that, as documented in Duckworth and Seligman (2005), self-discipline predicts adolescent school success better than IQ does. Moreover, non-cognitive skills are very strong predictors of engagement in risky behaviours that impose costs not only for the individual, but also for society as a whole.

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