Review of Ondrej Rydval thesis "The impact of financial incentives on task performance: The role of cognitive abilities and intrinsic motivation"

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This is an excellent dissertation which is tightly focused on an important theme: The interaction of cognitive ability and incentives in performance. This is an important topic for economics because the focus on financial incentives alone has dominated organizational economics (and some applied literatures, such as crime and education, CEO compensation, etc.). But incentives much work in some way (or not at all), which opens up the possibility that they interact with cognitive skill. Furthermore, if there are substantial differences in intrinsic motivation then perhaps firms should worry more about selecting the motivated workers rather than motivating them with money. (All of this is not to deny some role for financial incentives, of course, it is just a matter of including other variables.)

The first two short essays take data sets from others and show sensitivity to cognitive capital type variables. These are important contributions because they show that paying attention to cognitive variables creates stronger inferences. However, these are modest contributions compared to chapter 3 which reports new data.

The experiment and analysis in chapter 3 are excellent. This is a challenging task which (as noted) has nice properties for overloading working memory. Subjects must detect multi-period deterministic cycles, with a little bit of uniform noise getting in the way. The central treatment is displaying the base and cyclical components concurrently (providing external memory) or on sequential screens (which requires serious memory).

The candidate has also done a superb job of mastering a complicated and massive literature on memory, and also other cognitive traits (e.g. Need for Cognition) that may be relevant.

The analyses clearly show that working and short term memory (WM, STM) have a strong influence on performance in the sequential task. There are also some other interesting effects, such as a positive effect of an exogeneous pre-play windfall of money. (This is ironic, since the standard prediction in incentive theory is that incentives should only matter if they are linked to performance, or can be taken as signals of the nature of the job (a la Benabou and Tirole); yet here the unliked incentive has a noticeable effect.)

One substantial concern (which is easily remedied) is that the early and late comparison uses the same sequence of realizations (presented early and late in the experiment). This is a problem since it could reflect pure memory for the specific sequence values rather than learning to detect the cyclicality per se. (That is, subjects did not learn the cyclical component but simply recognize the first couple of pieces of the sequence and call up the remainder from memory.) This is a subtle distinction but potentially important (cognitive psychologists are likely to care about things like this). One way to get around this is just

to use some kind of average of the late-period forecast error rather than focus on the early vs late comparison.

My other comments are mostly rather minor.

1 P 10 Figure 1. What is striking in this graph is that all the action is driven by about 5-10 of the 40 subjects who quit completely (0 measure) or do quite poorly in the No pay and NIS .1 conditions. If you took out the 0 performers, for example, and adjusted the cumulative percentages, none of the four groups would be different (I am conjecturing). This means that virtually all the effect is driven by quitting or refusing to work for free (or for a pittance).

Fn 13 "nurturing nature". Is this a typo? Also say a bit here about nature vs nurture even though you want to mostly avoid the debate.

Fn 17. This is great! A crucial question in this type of research is whether people with limited skill are aware of their limits and have access to markets, advice, skill improvement etc. Most economists accept as an article of faith that limited people are aware of their limits. If that isn't so it is very important because it means we cannot rely on self-interested limited people to endogeneously respond to their perceived limits. So this type of "institutional choice" experiment is extremely important.

P 25. People who do not know the IQ literature are often shocked that intelligence seems to depend so heavily on "simple" perceptual skills like working memory. But all the material I have read shows over and over that this is indeed the case. It is a blessing for this type of research too since it means some key parts of IQ can be easily measured and also causally influenced (as you have done).

Fn 25. Can you spell out more clearly how such a heuristic would perform in your environment (e.g. perhaps give an example and resulting forecast error performance)? This is quite key since it defends your design choice nicely. I would put it in the text discussion too. You may be criticized along the lines of "why did you do it this way?" and you have a good answer buried in this footnote.

P 45, bottom. As noted in my central comment above, I would like to see more analysis using not just this LATE minus EARLY measure but using more of the data (e.g. estimate a time trend for each subject as a dependent variable).

P 54. The windfall effect could work through mood or emotion. Alice Isen (Cornell) has a ton of papers on this, I am not sure how solid they are but you should read a little or speculate on how the windfall is working. It could also be a kind of automatic reciprocity ("giving back" after winning).

Fn 82. David Dunning at Cornell has the best stuff on how the weakest performers are the most overconfidence because they don't realize how weak they are. This is crucial for my comment on fn 17 above.