Don’t Worry! Be Productive?

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Abstract

We show in a real-effort laboratory experiment that increased levels of worrying and fear (as they e.g. accompany economic recessions) do not depress worker productivity.

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JEL CLASSIFICATION: J24, C91, D20.
1 Introduction

Determinants of worker productivity have received considerable attention in the economic literature. Beyond factors related to incentives and workplace structures, a recent paper by Oswald et al. (2015) shows that feelings of happiness (sadness) raise (lower) worker productivity, implying that firm policies which foster (reduce) staff (un)happiness may “pay back” and raise workers’ performance. On top, the findings suggest that economic happiness drivers (like variation of income or job prospects over the business cycle (e.g. Beaudry et al. (2011) and Stutzer and Frey (2010)) may have repercussions on the economy by changing labor productivity and output.

While these findings are intriguing, one limitation of Oswald et al. (2015) is their focus on a simple positive-negative affect scale. The psychological literature, in turn, stresses that behavioral responses to emotions depend on the precise emotion induced, especially for negative affect states (e.g. Rick and Loewenstein (2010)). As negative feelings in economic contexts commonly relate to worries and fear rather than sadness (e.g. think about emotional reactions to corporate job cuts), we expand on Oswald et al. (2015) by testing for productivity responses to changes in experienced levels of worrying.\footnote{The annual stress reports by the American Psychological Association show a high prevalence of worries among Americans. These feelings moreover systematically vary with economic events (contrary to feelings of sadness induced by the random non-systematic family tragedies analyzed in Oswald et al. (2015)).}

Theoretically, the link between worrying and worker productivity is ambiguous (see e.g. Yu (2014) and media contributions like Newsweek (2010), New York Times (2015)): worrying may, on the one hand, absorb mental capacity that fails to be available for the task at hand and may hence reduce labor productivity; but it might, on the other hand, also increase workers’ level of arousal and consequently raise performance. We empirically assess the effect in a real-effort laboratory experiment, where worrying is induced by manipulating participants’ perceived real-world job prospects (while leaving incentives for the laboratory-task unchanged).\footnote{Note that mood-changing real-world events are hardly suited for identification as emotions and incentive structures commonly change simultaneously.}

Two findings emerge. Firstly, our worry-induction triggers a quantitatively relevant response of participants’ experienced feelings of anxiety and fear (while no effect on sadness can be established). Secondly, these emotional changes have a zero-impact
on individuals’ productivity, indicating that effects related to the opposing mechanisms sketched above compensate each other.

2 Methodology and Results

Main Experiment

The main experiment was conducted at the Ruhr-University Bochum with 112 student participants.\(^3\) It consists of two parts. The first part is designed to manipulate participants’ mood and is framed as a student survey on job market prospects. Participants are randomly assigned to a treatment and control group. In the treatment group, negative mood is induced by a short article describing the difficulties of many young academics in Germany when entering the labor market (see the instructions in the online appendix). Subsequently, participants are asked to imagine that they themselves experience difficulties with finding a stable employment after their degree and answer reflection questions on the challenges related to this situation. The control group, in turn, is asked to read an article stressing the positive overall labor market prospects of academics in Germany, namely their low life-time unemployment risk and high wages. The control group’s reflection questions are kept neutral and elicit participants’ preferences on different job aspects.\(^4\)

The design of this mood induction offers several advantages. Firstly, the worrying and control induction are comparable in length and both consist of an article on the labor market situation plus reflection questions. Mood variation is moreover achieved without altering participants’ incentives for the real effort task in the second part of the experiment. Finally, the induction reflects how worrying might be spread in economic downturns: A person might read on labor market issues in the news and reflect on them.

To assess the effectiveness of our mood induction, participants are asked to answer the expanded version of the Positive and Negative Affect Schedule

\(^3\)We exclude nine subjects from the analysis who did not answer all questions within a given time limit. The experiment is implemented using z-Tree (Fischbacher (2007)).

\(^4\)The induction hence draws on features of the Velten procedure in psychological research, in which subjects are presented with positively or negatively framed statements and of the autobiographical recall method, in which participants are asked to recall and write down a mood event (Gould et al. (2015)).
(PANAS-X) after the induction. PANAS-X consists of words describing different feelings and subjects are asked to state the intensity with which they feel these emotions on a five-point scale (see Watson et al. (1988)). Our PANAS-X scores indicate that the mood induction was successful: Scores on the negative affect scale are 1.62 (1.40) on average for the treatment (control) group and significantly differ from each other (F(1,101)=3.81, p=0.054; see the online appendix for the definition of the PANAS-X scales). The relative mood difference corresponds to 16% (= (1.62-1.40)/1.40) and is hence comparable in size to the one in Oswald et al. (2015). Analyzing lower order scales, we find that salience of negative labor market prospects increases reported levels of fear (F(1,101)=3.73, p=0.056), but has no effect on the PANAS-X scales for serenity, sadness, self-assurance and attentiveness.

In the second part of the experiment, subjects perform a real-effort task. The task consists of adding five 2-digit numbers. Students are paid 60 cent per correctly solved task and this payment is made explicit. They perform the task in three consecutive rounds each lasting 10 minutes and receive absolute performance feedback after every round. At the end of the experiment they are paid for one randomly chosen round.

The results suggest a zero-effect of worrying on individual productivity, as measured by the number of correct additions. In the first round, subjects in the treatment and control group solve 16.47 and 16.11 additions on average, where equality of these averages cannot be rejected (F(1,101)=0.10, p.=0.759). The same holds true for rounds 2 and 3. This result is robust to reassessing the link in a regression framework that controls for subjects’ gender, age, field of study, current semester, average grade, native language, nationality and a session fixed effect (see Table 1, Column (1)).

Reassessing the Effect in a High Unemployment Environment

To corroborate these findings, we reran the experiment with 62 students at the Laboratory for Research in Experimental Economics (LINEEX) of the University of Valencia. As currently every second young Spaniard is out of work, with a university degree not helping much to increase job prospects, we

\footnote{One subject did not answer the questions in the time limit and was excluded.}
expect reference to this bleak labor market situation to have a strong mood dampening effect for this subject group. Following this line of argument, the treatment group is asked to read an article describing the poor labor market prospects of young Spaniards plus reflection questions on the challenges of this situation. The control group is asked to read a text with instructions for building paper planes plus neutral reflection questions. The rest of the experiment follows the main study with one modification: as comprehensive checks in the wake of the mood manipulation may dampen its effect (see e.g. Koellinger and Treffers (2015)), we refrain from eliciting the PANAS-X scores after the mood induction but ask subjects to rate their current happiness on a five-point scale before and after the induction.

Increasing the salience of negative labor market prospects is again found to be effective in manipulating individuals’ mood: Subjects in the worrying condition report to be less happy than subjects in the control condition after the induction ($F(1, 59)=8.23$, $p=0.006$). PANAS-X scores elicited at the end of the experiment furthermore, in line with the main experiment, suggest that the treatment only alters experienced levels of fear but has no effect on sadness or other negative emotion classes.

Paralleling the results from the main experiment, we furthermore do not find an effect of worrying on productivity. For all three rounds, worrying induced subjects solve on average 12.92 additions and subjects in the control condition solve 13.46 additions. This difference is not statically significant ($F(1, 181)=0.27$, $p=0.607$). There is also no effect of worrying on performance if one considers any of the rounds separately. This result is confirmed in regressions that control for the covariates described above plus a dummy indicating subjects with a job offer and a variable for participants’ number of internships (see Table 1, Column (2)).

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6 We do not use a positively-framed text on employment issues in the control condition as any reference to employment prospects may induce worrying for that subject pool.

7 To account for this point, we also ran two additional sessions at the Ruhr-University Bochum in which we did not elicit mood states before the math task. The results confirm our baseline findings and yield no significant difference in the number of additions solved in treatment and control group.

8 Spanish students likely solve less additions than their German counterparts as they were not allowed to use pen and paper.
3 Conclusion

Summarizing, our results show that worrying induced by salience of negative labor market prospects has a zero-effect on worker productivity. This contrasts Oswald et al. (2015) who find significant productivity responses after sadness and happiness inductions - despite similar experimental designs and quantitatively similar mood shifts by the induction. This underpins that behavioral consequences of mood states depend on the precise emotion induced. Researchers in the emerging literature on emotions and economic behaviour (see e.g. Kirchsteiger et al. (2006), Ichter and Zarghamee (2011), Koellinger and Treffers (2015)) hence must be careful: If positive moods imply a given behavior, it does not mean that negative moods imply the opposing behavior or that subclasses of moods imply aligned behavior.

Note moreover that studying the link between emotions and behavior requires laboratory experiments since incentives and moods commonly change simultaneously in the field. We aim for external validity by using participants subject to significant unemployment risk in their daily life and reminding them of their bleak labor market prospects in a similar way that individuals during recession are reminded about increased unemployment risks. Against that background, our evidence suggests that mild worrying, e.g. in the wake of job cuts or economic recessions, does not systematically dampen worker productivity and firm performance.9

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9 Whether this result carries over to intense worrying and fear is an interesting question for future research.
References


## Table 1: Regression Results

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Standard errors in parentheses.