The affective load of inequality decreases individual productivity

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Abstract

Evidence suggests that the level of inequality in a society has a negative effect on aggregated output. Diverse explanations on how this effect takes place have been developed in the economics literature. We propose a novel explanation in which the degree of inequality to which an agent is exposed induces an specific affective load which, if sufficiently high, could decrease productivity. In a controlled laboratory setting we exogenously vary the level of poverty awareness as a proxy to inequality. We find that subjects assigned to the "Awareness" treatment condition have lower average productivity with respect to subjects assigned to the "No awareness" baseline condition. A questionnaire and a face recognition software provide quantitative measures of the moods and emotions evoked by the experimental conditions. We provide evidence that the affective variation found in these conditions mediates this decrease in individual productivity.

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1 Introduction

Recent research on income and wealth distribution highlights the considerable magnitude of inequality in developed countries (Piketty and Saez, 2014, 2006, 2003; Atkinson et al., 2011). According to Piketty and Saez (2003) the top decile income share in the United States to the present day is close to 50%, the highest in its history and the largest among developed countries. Moreover, the top decile wealth share in this country is higher than 70% Piketty and Saez (2014). Thus, 90% of the population of this country possesses only 50% of the income and less than 30% of the wealth.

The importance of a high degree of inequality in a society goes beyond mere equity arguments. Income inequality decreases the rate of economic growth of a society (Ostry et al., 2014; Berg et al., 2012; Easterly, 2007; Persson and Tabellini, 1994). According to Ostry et al. (2014) an increase in net gini from 37 to 42 decreases the rate of growth by 0.5 % on average. Thus, the degree of income inequality is detrimental to the total output of a society.

The channels through which inequality decreases output have been widely discussed in economics. From an aggregated perspective they could rely on market assymetries associated to inequality, in this respect Galor and Zeira (1993) show that credit market constraints could limit potential returns to investment triggering efficiency losses. Moreover, Galor and Moav (2004); Perotti (1996) show that these assymetries could lead to low human capital accumulation and thence to low output. These channels could also have ground on the social consequences of inequality, forAlesina and Perotti (1996) this phenomenon generates political instability which in turn reduces investment. Also, it impedes the economic and political consensus required to adjust to shocks and sustain growth Rodrik (1999).

Another strand of literature emphasizes the effect of social outcomes on status-seeking and therefore behavior. **?** used a modified version of Friedman-Savage utility that depends on relative and absolute wealth, in equilibrium there may be too much or too little gambling. Nevertheless, this result abstracts from pareto-efficient considerations Becker et al. (2005) extended this model to include status as a market good, this leads to the conclusion that under certain conditions relative status could lead to inefficient gambling outcomes. Also **?** show that the endogenous risk a la **?** is pareto inefficient when using a conventional model of growth.

The effect of inequality on choice is also studied under the umbrella of behavioural economics. Using reference dependent preferences (Kahneman and Tversky, 1979) Genicot and Ray (2014) show that a high degree of inequality lowers agents' aspirations which in turn lead to a low level of investment. Furthermore, according to Fehr and Schmidt (1999) agents exhibit in their preferences an aversion to inequality which contours choice. Experiments on social choice not only provide evidence on this respect (Fehr and Gächter, 2000; Falk et al., 2008; Gintis et al., 2003) but have also shown that inefficient punishment to players whose income is above group average takes place at the expense of their earnings or the group earnings Dawes et al. (2007).

In this paper, we propose a different channel through which inequality may dampen output. In our explanation the affective load that inequality comprises hinders individual productivity. Our contribution is providing a direct channel from affective motives to productivity abstracting from behavior. Hence, our explanation could shed light on the motives of behavioral change triggered by inequality.

Our first hypothesis is that inequality would enhance affects with high motivational intensity or high propensity to approach or move away from a positive or negative situation, respectively. We adopt such a basis given the findings of Dawes et al. (2007) and Xiao and Houser (2005), who find in the context of a public good game that the intensity of emotions in situations of inequality would correlate with the intensity and dimension of the punishment. In addition, based on the findings of Harmon-Jones et al. (2013, 2012), we hypothesize that the presence of affects with higher motivational intensity has a negative effect on cognitive scope, so that task oriented performance diminishes.

In a controlled laboratory setting we exogenously vary the degree of awareness of the condition in which poor people live. Admittedly in more unequal societies subjects experience higher awareness of such conditions. We use a mood induction procedure to induce awareness. In the treatment condition subjects are fully aware since they watch a video clip about the conditions in which a family in poverty lives. This is analogous to live in an unequal society. In the control condition subjects observe a neutral video, this video has proven to evoke no emotion or mood in the psychology literature, in this condition subjects are naive, this is, they are not aware about the conditions in which poor people live.

To measure individual productivity we use a real effort task. We used the sliders task introduced by Gill and Prowse (2009), which consists on setting as many sliders as possible in the exact middle of the supplied range using the mouse coursor. The advantages of this task are that it does not require knowledge of any kind, the instructions of the task are easy to follow and the output has no usage for the experimenter. Productivity in our setting is measured by the number of correctly aligned sliders within 20 minutes.

We measure psychological affects in two complementary ways. We administered a PANAS questionnaire right after the watch the video clip. This questionnaire provides a subjective evaluation of the intensity of moods at the moment in which the questionnaire is handed in Watson et al. (1988). On top of this, we also use a facial expression recognition software to identify the emotions that the videos evoke in real time.

We found that the subjects assigned to the awareness condition produce on average less sliders with respect to the subjects that are assigned to the baseline. This finding not only holds at the average but also holds throughout the whole distribution given that the empiric distribution of completing correctly one task when assigned to the treatment is stochastically dominated by the empiric distribution of completing correctly one task when assigned to the control.

Furthermore, the awareness video evokes on average higher negative affects compared to the control condition. Furthermore, we find that subjects assigned to the treatment of poverty awareness report higher intensity of emotions and moods with higher motivational intensity, such as excitement, guiltiness, upset, hostility and alertness with respect to subjects assigned to the neutral video. A mediation analysis allows us to determine that the difference in productivity disappears whenever the variation across treatments of these affects is taken into account.

Moreover, we provide evidence of heterogenous treatment effects that further validate the main finding of this paper. Our data suggests that the treatment effect becomes stronger as the subject's country of origin is higher in the Human Development Index, suggesting that subjects who come from more equal societies would have a stronger decrease in productivity when assigned to the control as compared to their counterparts from developing countries.

This paper is organized as follows: In section 2 we provide a detailed description of our experimental design. In section 3 we provide a description of the methods used to provide an affects measurement. Furthermore, the results of the real effort task are provided in section 4 along with the affects measurement and the mediation analysis. In section 5 we provide several robustness tests that corroborate our findings.

2   Design

Our dataset consists of 15 sessions. The sessions were conducted at the CentERLab in Tilburg University and all the subjects were students at the university. We used Z-Tree (Fischbacher, 2007)to implement the experiment. Subjects were recruited via an online system. On average each session lasted approximately 45 minutes. Between five and ten subjects took part in each session. No subject participated more than once in the experiment. A total of 155 subjects participated in the experiment.

At the moment of arrival subjects were randomly assigned to one of three possible conditions: 'Awareness', 'No Awareness' and 'No video'. In the 'Awareness' condition subjects watched a video clip that depicted the struggles of a poor family living in the dumps of Moscow[1] . In the 'No awareness' condition subjects watched a video that did not evoke any emotion or mood, this video is often used in the psychology literature to induce a state of neutrality (Rottenberg et al., 2007). In the 'No video' condition subjects did not watch any video. 55 subjects participated in 'Awareness', 50 subjects participated in 'No awareness' and 50 subjects participated in the condition 'No video'.

After watching the video in the first two conditions or at the moment of arrival in the 'No video' condition, a schedule of positive and negative affects schedule (PANAS) was handed in Watson et al. (1988). In this questionnaire subjects stated the current intensity, on a scale from one to five, of each

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[1]The video is available in the following link https://www.youtube.com/watch?v=lDzhufj9GN0

of the moods that were enounced. In the questionnaire 10 negative affects and 10 positive affects appeared. This questionnaire can be found in the appendix 2.

After successful completion of this questionnaire, subjects performed a time consuming real effort task. We used the task introduced by Gill and Prowse (2009), which consisted of setting the highest possible number of sliders in the exact middle point of a range using the mouse coursor. The task was unfamiliar to all participants and it entailed a cost of effort in terms of attention and patience. In addition, the output of the task was of no use to the experimenter.

Subjects assigned to any of the treatments faced the same powered piece-rate incentives: the accurate completion of a task increased their experimental earnings on 5 cents. Each session was divided into ten periods of 2 minutes each. A subject performance in each period counted toward her earnings.

Finally, subjects completed a final questionnaire that inquired demographic characteristics such as age, study, country of origin and gender. The questionnaire also contained proxy questions that intended to determine the socioeconomic status of the subject. This questionnaire can be found in appendix 3. Throughout the whole experiment subjects were video recorded with their consent, these videos were analyzed using the face recognition software FACEREADER.

3 Results

Effort

The measure of productivity in our experiment is the number of correctly aligned sliders in a session. On average subjects solved 167.81 sliders with a standard deviation of 52.01 in a session. As it is evidenced in Figure 1 subjects in the 'Awareness' condition solved 165.2 sliders as compared to 179.2 sliders in the 'No video' condition. This difference is borderline significant (t-test, p= 0.0625). Hence, the treatment effect has a negative effect size of 0.30 standard deviations. Thus, a subject assigned to the treatment produces on average 8% less sliders as compared to a subject assigned to the control.

This documented difference in productivity does not only hold for the average but across the whole empirical distribution. This is evidenced in Figure 2 where the stochastic dominance of the probability of completing a slider of the 'No Awareness' with respect to that of 'Awareness' is evident across the whole support of the distribution. Moreover, there is empirical evidence that the empirical distributions of 'Awareness' and 'No awareness' are not drawn from the same distribution (KS-test, p=0.003).
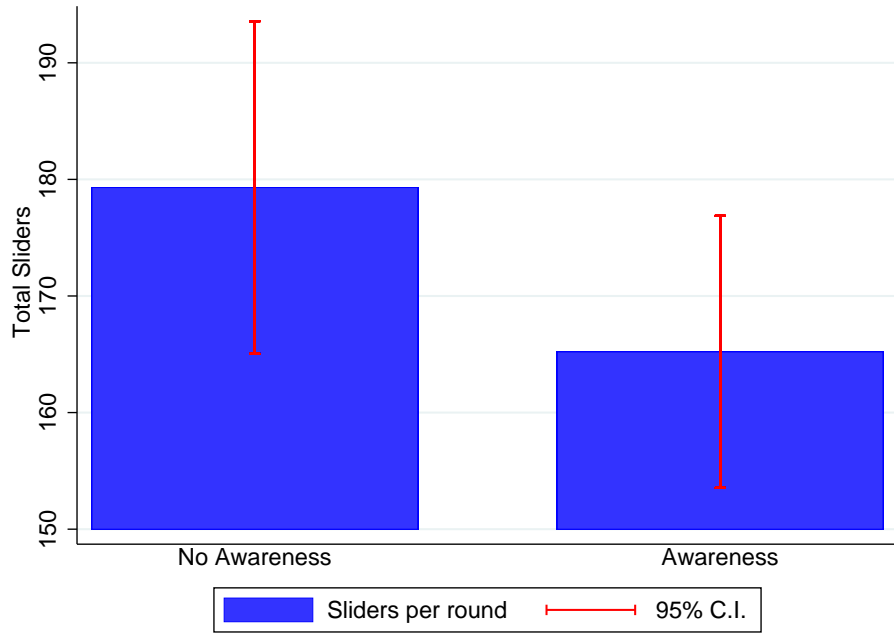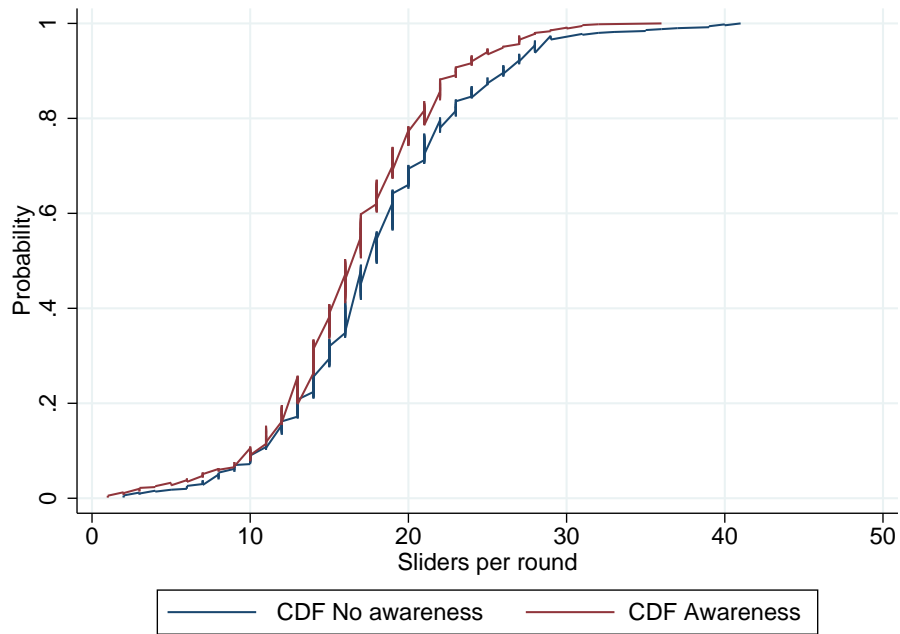
Figure 1: Average effort by condition

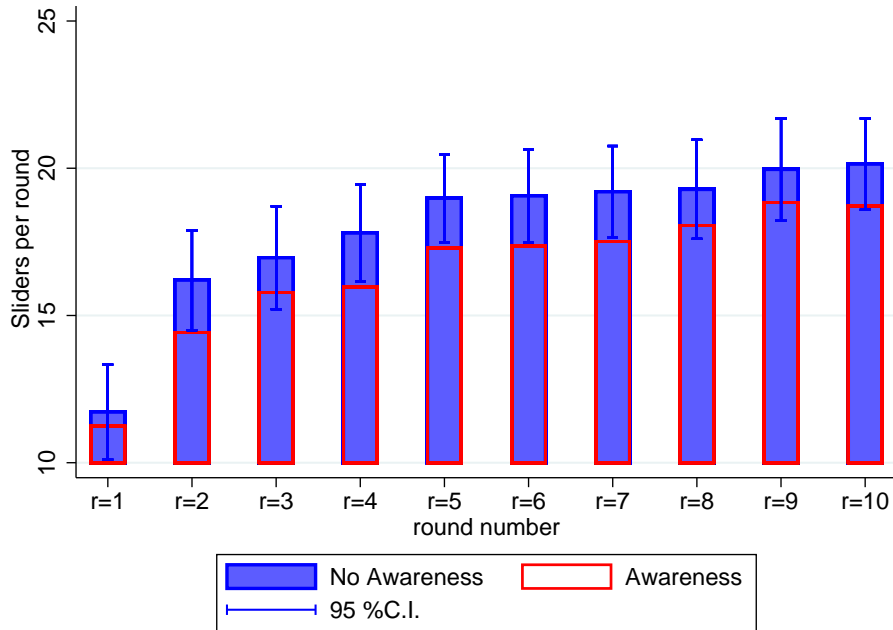Figure 2: Empirical Cumulative Distribution of Effort by condition

Figure 3: Average effort per round by condition

Effort Dynamics

We provide evidence suggesting that the treatment effect evidenced in the difference in average number of total sliders is associated to watching the treatment video. Given our protocol it is possible to evaluate the subjects' performance in each of the rounds. This data is useful to determine whether the video had an immediate impact on the subjects performance and whether the effect of the video lasted throughout the whole session.

In Figure 3 it is evident that the average number of sliders solved by subjects assigned to the inequality treatment is lower with respect to the average sliders solved by subjects assigned in the control across all the rounds. Thus, we disregard the possibility that the difference in average performance across treatments, presented in the previous session has to do with a difference in learning due to a hypothetical randomization failure. Moreover, the fact that the difference in performance across conditions is evidenced from the first round onwards allows us to infer that the video was the source of the difference in performances and not any other factor. Finally, it is possible to conclude that the effect of the video lasted throughout the whole session given that there seems not to be a convergence in the gap of average performance between conditions.

4　Affects

Subjective measure

In this subsection we present the result of the PANAS questionnaire Watson et al. (1988). This schedule measures the subjective intensity, on a scale from 1 to 5, of 20 different affects after the subjects watched the video The questionnaire contains 10 positive and 10 negative affects. We provide the average and standard deviation of the subjective evaluation of subjects by condition. Table 1 and Table 6 present the mean and standard deviation of the affects contained in the questionnaire for "No awareness" and "Awareness".

Table 1: Mean and Standard deviation of Positive affects

Condition	Interest	Excited	Strong	Enthusiastic	Proud	Alert	Inspired	Determ.	Attentive	Active
No Awareness	3.1	2.6	2.62	2.78	2.18	2.68	2.54	2.88	3.12	3.08
	1.129	1.03	1.028	1.093	1.101	1.406	1.092	1.023	1.118	1.007
Awareness	3.691	2.145	2.927	2.273	1.982	3.291	3.055	3.309	3.418	2.709
	1.153	1.079	1.2	1.146	1.269	1.257	1.253	1.103	1.013	1.227
Total	3.41	2.362	2.781	2.514	2.076	3	2.81	3.105	3.276	2.886
	1.174	1.075	1.126	1.145	1.19	1.359	1.202	1.082	1.07	1.138

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Table 2: Mean and Standard deviation of Negative affects

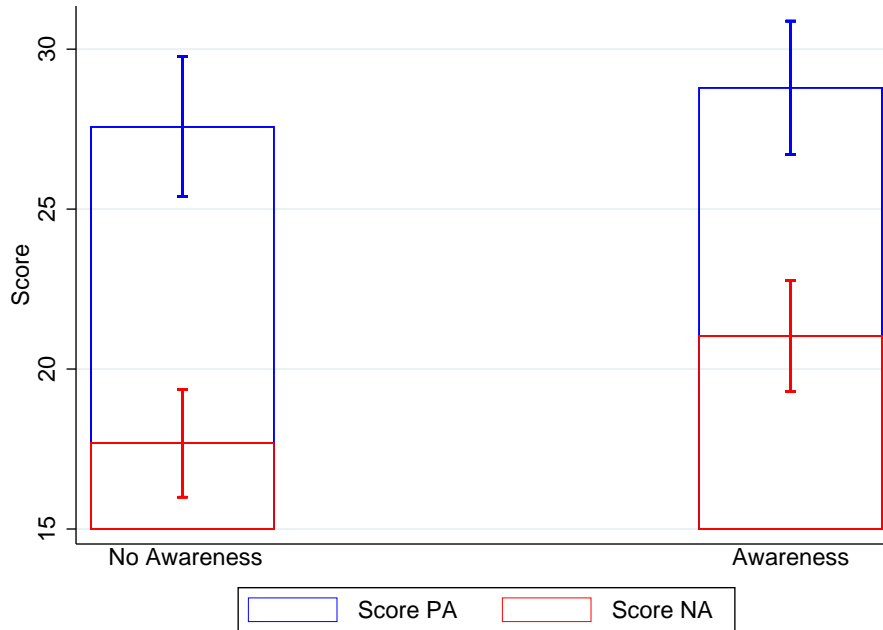| Condition	Distressed	Upset	Guilty	Scared	Hostile	Irritable	Ashamed	Nervous	Jittery	Afraid
No Awareness	2.56	1.62	1.42	1.54	1.4	2.04	1.44	2.1	2	1.56
	1.215	1.048	.784	.838	.728	1.049	.760	1.074	.947	.8369
Awareness	2.509	2.782	2.218	1.709	1.818	2.036	2.182	1.982	2.145	1.655
	1.016	1.257	1.228	1.012	1.002	1.018	1.188	1.097	.9313	.9273
Total	2.533	2.229	1.838	1.629	1.619	2.038	1.829	2.038	2.076	1.61
	1.11	1.295	1.11	.9329	.9028	1.028	1.069	1.082	.9374	.8825

Figure 4: Effort by condition

These tables along with Figure 4 evidence that the "Awareness" condition increases the score of negative affects significantly with respect to the "No awareness" condition (p= 0.0063) . Furthermore there is no significant difference in the score of positive affects between these two treatments (p=0.2953). Thus, the treatment video induces an affective load of negative valence.

Overall, "Awareness" induces considerably higher average negative affects with respect to the usual findings of the PANAS (Watson et al., 1988) since the average scoring 21.036 with a standard deviation 7.63 of negative affects after watching the awareness video is considerably larger than 14.8 with a standard deviation of 5.4, the usual findings of this survey.

Furthermore, by analyzing each of the affects separately we could determine the particular affects that the treatment video evoked. On the one hand from Table 1 it is evident that the treatment condition decreases on average positive affects such as excitement (p=0.0367) and enthusiasm (p=0.0167) with respect to the control.The treatment video also increases the average positive affects such as interested (p=0.0040) and inspired (p=0.0251) with respect to the control. On the other hand, the treatment 'Awareness' increases negative affects such as: guilt (p= 0.0002), upset (p=0.0000), hostility (p=0.0278), alert (p= 0.0240) and shame (0.0007). There is no empirical evidence that the treatment decreases negative affects.

Altogether these results suggest that the treatment video induces a considerable increase on the

Table 3: Mediation Analysis for Affects

	Effort (1)	Effort (2)	Effort (3)
Awareness	-14.10	-12.79	-3.834
	(-1.55)	(-1.36)	(-0.35)
score NA		-0.00973	
		(-0.01)	
score PA		-1.050	
		(-1.77)	
Constant	179.3	208.4	205.2
	(27.18)	(9.55)	(10.55)
Affects	No	No	Yes
Observations	105	105	105
R2	0.0227	0.0522	0.0987

This table presents the linear regression estimates of the model $TotalEffort_i = \beta_0 + \beta_1 Awareness_i + \beta_1 ScoreNA_i + \beta_2 ScorePA_i + A' Affects_i + \epsilon_i$ with $E(\epsilon_i | Awareness_i, ScoreNA_i, Score_P A_i, Affects) = 0$ and $Affects_i = [enthusiasm_i, upset_i, hostile_i, alert_i interest_i]$. Model (1) Presents the coefficients of a regression when the model is restricted in the following way $\beta_2, beta_3$ are equal to zero and A is a vector of zeros. Model (2) Presents the coefficients of a regression when the model is restricted in the following way A is a vector of zeros. Model (3) presents the coefficient of a regression with no restrictions imposed over the model. T-tests are presented in parentheses.

score of negative affects, which in turn is the result of the increase on the intensity of some particular negative affects. Although there seems not to be a significant difference in the score of positive affects across conditions, there are some differences in particular affects triggered by the treatment video. Whether these changes in the score of the general of particular affects lead to lower productivity requires a different analysis, which will be presented in the next subsection.

Physiological Measure

Data to be analyzed in FACEREADER

Mediation Analysis

To determine whether the variation of mood and emotions induced by the treatment video is the driver of lower productivity in the real effort task we perform a mediation analysis. Table **??** reports the results of the linear regression with the measure of effort as dependent variable and the condition 'No Awareness' as the baseline. From this table it is possible to infer that subjects assigned to the 'Awareness' condition underperform on 14.10 sliders on average with respect to the baseline, ceteris paribus.

Furthermore, this table shows than when the score of the Negative and Positive affects respectively are included in the model, the coefficient associated to 'Awareness' remains to be large, it indicates an underperformance of 12.79. This evidences that the increment in the scoring negative affects induced by the treatment video does not explain the variance of effort across treatments.

In addition, we use the variation of the particular affects that have a significant variation in the treatment condition to determine whether these specific affects lead the video. We included in the model five of the affects that varied significantly in the treatment. We have chosen, through a principal component analysis, the five affects that capture more than 85% of the variance of the whole set of affects. The coefficients show that whenever these affects are included the difference between the control and treatment becomes small. Hence, there is evidence that the variation of these affects could capture the variation of effort across treatments.

Given this mediation analysis we can conclude that the variation of the affects enthusiasm, upset, hostile, alert and interest induced when the treatment video is watched capture the effort difference between the conditions observed in our results. We can therefore conclude that it is through the variation of some particular affects that the difference in productivity between treatments takes place.

5   Heterogeneity of the Treatment Effect

To examine the heterogeneity of the result that inequality decreases individual productivity through an affective channel we use demographic characteristics associated to socioeconomic status and prove that the treatment effect is accentuated once this characteristics are controlled for.

First we use the country of origin of the subjects as proxy for the level of exposure to poverty. We indexed the country of origin to the ranking of the Human development index (HDI). This ranking orders countries according to their degree of development, where the country with ranking 1 would be the most developed country. Controlling for this variable is analogous to vary the level of "poverty awarenes" of the pool of subjects with respect to the treatment video. According to our hypothesis, subjects that come from more developed countries, which are less aware about the conditions in which poor people live, would experience a larger drop in their productivity when assigned to the treatment video. Moreover subjects that come from less developed countries are more familiar with these conditions and henceforth the effect of the treatment video is smaller or negligible on these subjects.

From table 4, we find that the interaction between being assigned to the treatment and the HDI ranking has a positive coefficient. This means that subjects assigned to the treatment provide high effort as they come from less developed countries. On the other hand, the interaction between the HDI ranking and the control condition has a negative slope, so that subjects assigned to the control

Table 4: Linear regression Effort on HDI ranking

	effort
	β
Awareness	-1.690**
HDIranking	-0.013*
Awareness*HDIranking	0.028**
Constant	17.375***
R^2	0.068
N	149

This table presents the linear regression estimates of the model $Effort_i = \beta_0 + \beta_1 Awareness_i + \beta_2 HDIranking_i + \beta_3 HDIranking_i * Awareness_i + \epsilon_i$ with $E(\epsilon_i|Awareness_i, HDIranking_i) = 0$. Standard errors are presented in parentheses. *** significant at 0.1 percent level, 2. ** significant at 1 percent level. * significant at 5 percent level.

would provide less effort as they come from less developed countries. The coefficient associated to the treatment evidences that subjects that come from the most developed country provide significantly less average effort whenever they are assigned to the treatment with respect to their counterparts assigned to the control. Moreover, as the degree of development increases, by means of the ranking, this gap closes as it is evident in Graph 5 and Table .

Furthermore, we used a binomial categorization based on the HDI ranking. We define developed countries as the countries that rank from one to 50, officially these countries are considered as "very developed", countries whose ranking is higher than 50 are cathegorized as developing countries. This dichotomic categorization allows us to test whether subjects coming from developed countries would on average have a higher treatment effect with respect to subjects coming from developing countries.

As it is evident from Figure 6 subjects that come from developed countries have higher treatment effects with respect to subjects that come from developing countries. On average a subject from developed countries assigned to the treatment video would produce 26.32 sliders less than a subject from a developing country assigned to the control (p=0.0323). Subjects from developing countries assigned to the control video and subjects from developed countries assigned to the control do produce on average the same number of sliders (p=0.7925).

These results further corroborate our hypothesis. Subjects that come from more equal societies
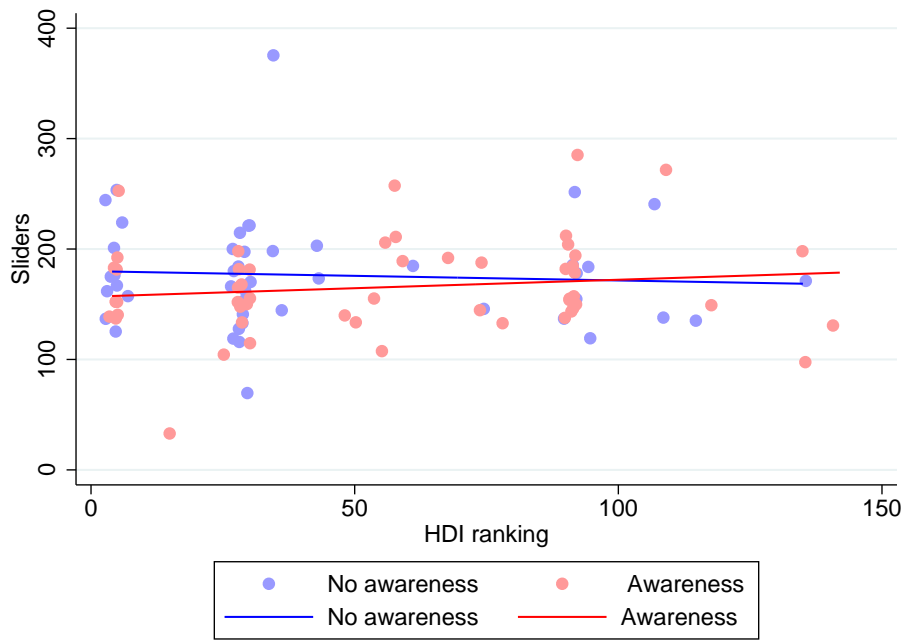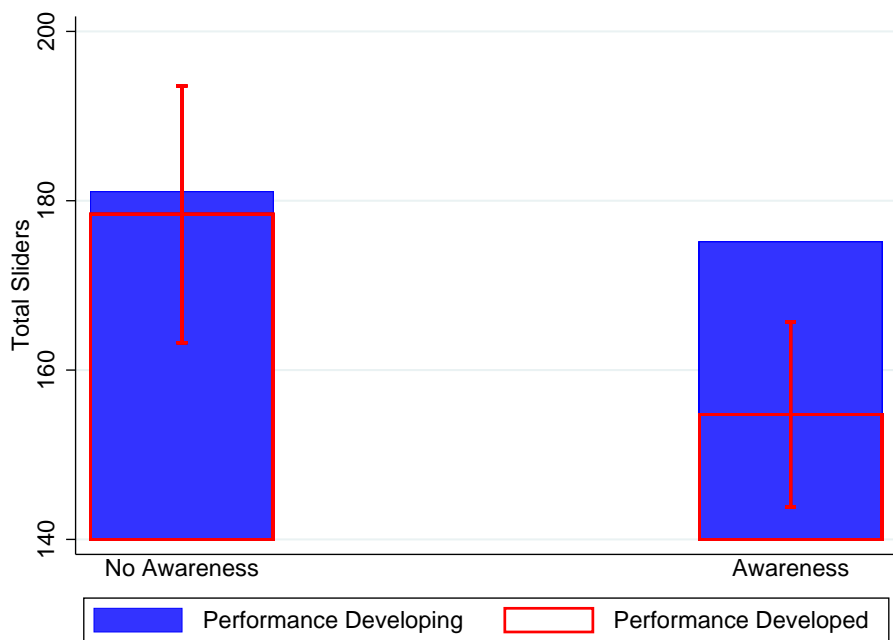
Figure 5: Effort against HDI ranking

Figure 6: Effort by condition

experience a lower probability of poverty awareness or inequality. We provide evidence that the assignment of these subjects to the treatment hinders their productivity in a higher degree in comparisson with those from developing societies.

6   Robustness

As mentioned previously we use the condition "No video" to test the robustness of our findings. First, we would like to know how subjects in this condition perform in the real effort task. Subjects assigned to the 'No video' condition solved 159.22 sliders on average. Thus, there is no evidence of a difference of this average with respect to the average sliders solved in the 'Awareness' condition (p=0.2801). Nonetheless, there is empirical evidence of a difference between 'No video' and 'No Awareness' (p=0.037), the average performance of subjects assigned to the later condition is 20.08 sliders higher on average.

Furthermore we use the dynamics of "No video" to show that the lenght of the video is by no means the reason that leads to a lower performance. In Figure 7 we compare the dynamics of "No video" and " Awareness" to show that after watching a video of nearly nine minutes, the subjects in this treatment provide a similar pattern of effort as subjects that did not watch any video. This means that depletion by means of time sitting in the laboratory is not the driver of our effect.

We could also determine if the treatment effect observed in our results is a consquence of the video in the control condition increasing effort by means of evoking positive affects in the subjects. Figure 8 shows that there is no evidence of a difference in positive affects between "No video" and " No Awareness". '. We find that the neutral video and not displaying a video have no significant difference in terms of positive affective load scoring (p=0.075) and negative affective load scoring (p=0.2240). This result supports our protocol and the accurateness of the neutrality of the video of the "No Awareness" condition.

To provide further evidence of the claim presented above we present the mean and standard deviation of each of the moods contained in the PANAS questionnaire for "No video" and " No awareness". From Table 5 it is evident that "No awareness" elicits the statistically the same mood intensities as "No video" except for significant differences in Interest, pride and active. We can therefore state that the video in "No awareness" is appropiate to evoke a state of neutrality since there is empirical evidence that subjective scales of moods of subjects that watched this video are different only for few moods with respect to subjects that did not watch a video.
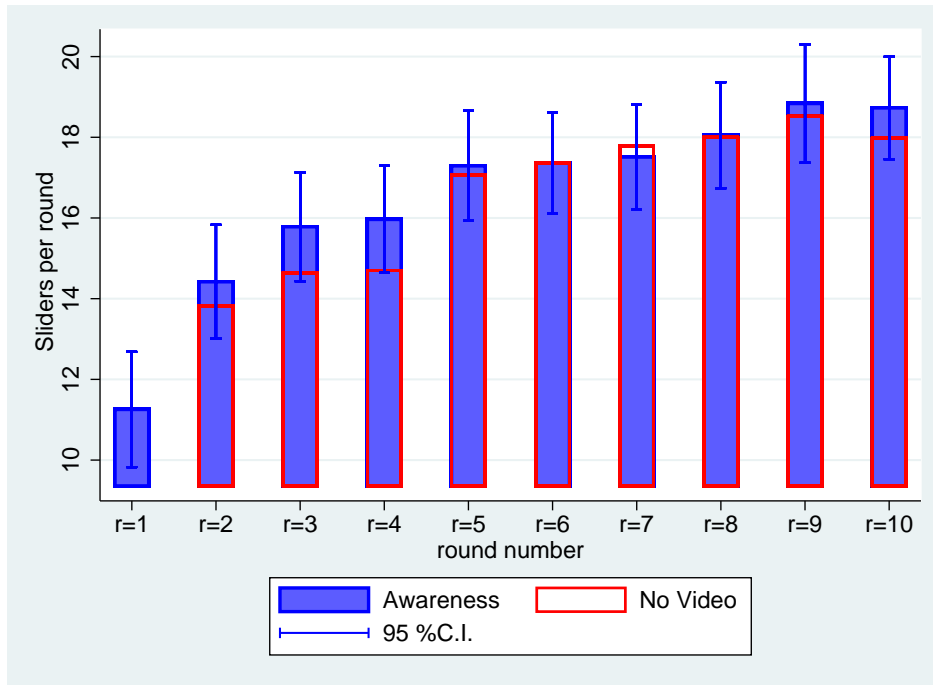
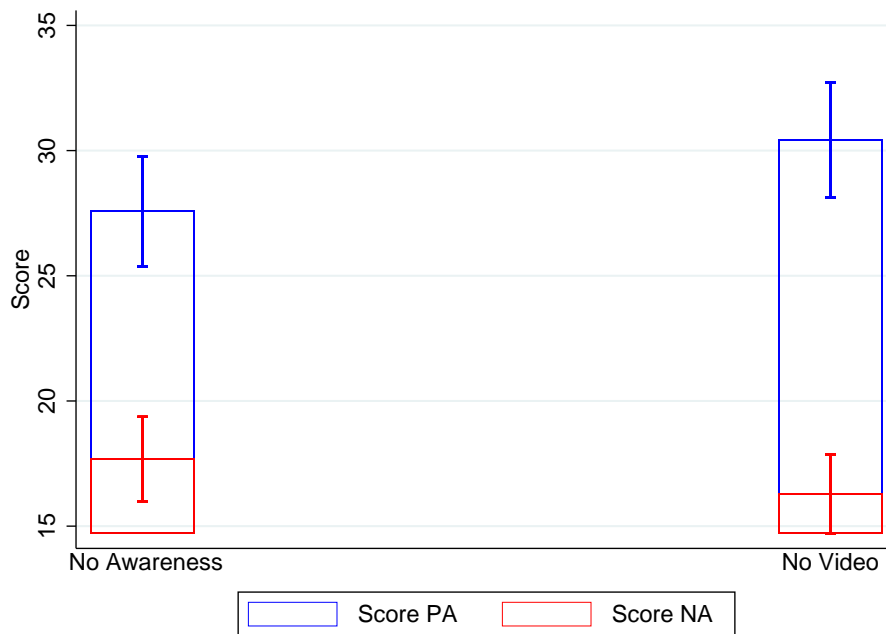14

Figure 7: Effort " No video" and " No Awareness"

Figure 8: E

Table 5: Mean and Standard deviation of Positive affects

Condition	Interest	Excited	Strong	Enthusiastic	Proud	Alert	Inspired	Determ.	Attentive	Active
No Awareness	2.56	1.62	1.42	1.54	1.4	2.04	1.44	2.1	2	1.56
	1.215	1.048	.7848	.8381	.7284	1.049	.7602	1.074	.9476	.8369
No video	2.2	1.48	1.34	1.32	1.44	1.9	1.24	2.04	1.96	1.36
	1.088	.814	.745	.712	.732	.953	.591	1.087	.946	.7217
Total	2.38	1.55	1.38	1.43	1.42	1.97	1.34	2.07	1.98	1.46
	1.162	.936	.762	.781	.727	.999	.684	1.075	.942	.783

Table 6: Mean and Standard deviation of Negative affects

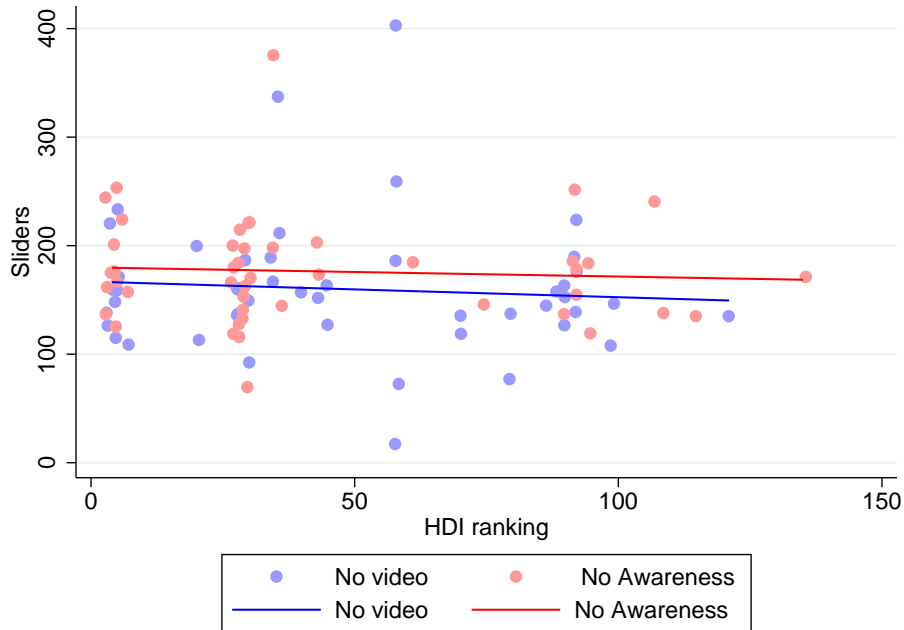| Condition	Distressed	Upset	Guilty	Scared	Hostile	Irritable	Ashamed	Nervous	Jittery	Afraid
No Awareness	2.56	1.62	1.42	1.54	1.4	2.04	1.44	2.1	2	1.56
	1.215	1.048	.784	.838	.728	1.049	.760	1.074	.947	.8369
Awareness	2.509	2.782	2.218	1.709	1.818	2.036	2.182	1.982	2.145	1.655
	1.016	1.257	1.228	1.012	1.002	1.018	1.188	1.097	.9313	.9273
Total	2.533	2.229	1.838	1.629	1.619	2.038	1.829	2.038	2.076	1.61
	1.11	1.295	1.11	.9329	.9028	1.028	1.069	1.082	.9374	.8825

Figure 9: Effort by condition

Finally we show that subjects in the "No video" condition provide a similar effort provision pattern with respect to "No Awareness". In Figure 9 we find that effort provision with respect to HDI ranking in the "No video" condition has a similar pattern with respect to that of " No awareness", this is, both exhibit a negative slope in the space effort, HDI ranking. This pattern is different to that of "Awareness" where this slope is positive. Thus the an effect of watching the " Awareness" video is a reversed pattern on the effort provision of subjects conditional on their HDI ranking. ". Furthermore, from Figure 10 it is possible to observe that there is no significant difference between the subjects that come from developed countries assigned to "No awareness" and " No video" . Additionally the performance of subjects assigned to "No video" and that were categorized as coming from developing countries is lower in average with respect to subjects assigned to " No awareness".

7   Conclusion

In this paper we present evidence suggesting that the affective load inequality decreases individual productivity. We used a mood induction procedure to exogenously vary the level of poverty awareness as a semblance to inequality. Our findings suggest that subjects assigned to the inequality treatment exhibit lower productivity compared to subjects that where in the control. Moreover, this effect is mediated by the affects that the treatment video evokes. This finding presents heterogeneous treatment effects, which further corroborate our hypothesis.
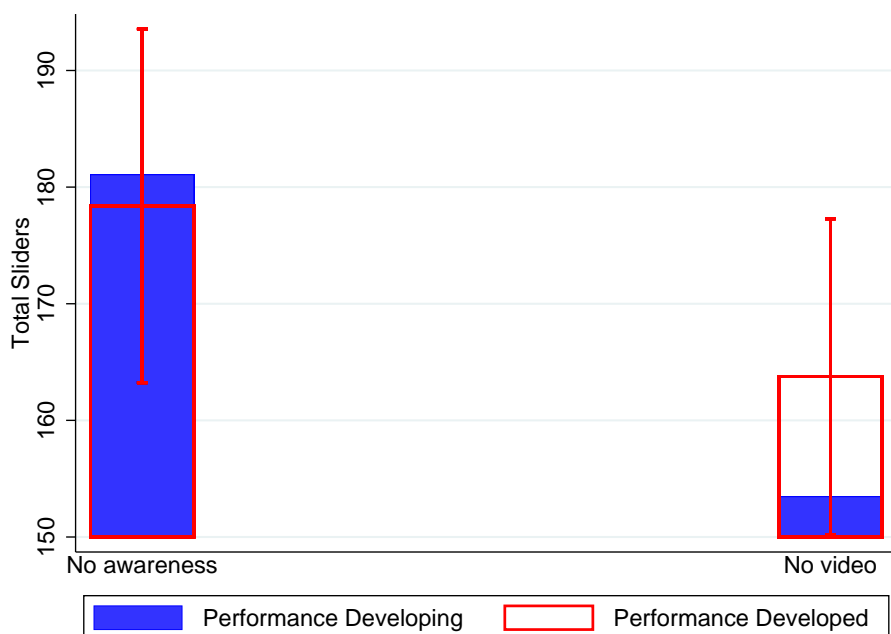
Figure 10: Effort by condition

The affective channel that is explored in this paper abstracts from behavioral considerations, since our protocol is such that a direct channel from variation in affects to effort exertion is traced. Hence, our results are suggestive of the affective channel as a motivator to some of the stylized facts in the literature that studies the relationship between individual behavior and inequality.

At this point we would like to stress the limitations of our research. First of all the channel proposed in this paper has to be further explored. Future studies should determine whether the same results hold for tasks that require higher cognitive abilities. We hypothesize that in such an scenario the treatment effects would be even stronger due to the findings of Harmon-Jones et al. (2013, 2012),that state that motivational intensity decrease cognitive scope.

Another limitation of our protocol is that we only consider awareness with respect to poverty as a proxy to inequality. Nevertheless, it is intuitive that inequality also encompasses awareness with respect to wealthy individuals of the sociaty. Further research should extend our findings using a video that raises awareness of wealthy individuals and determine whether a similar treatment effect is found. This would enhance the proposed affective channel and would determine how symmetrical is the effect with respect to each of the views of social comparison.

Additionally, the main result discussed in this paper could gain external validity if the treatment

effect is subject to a variation of the pool subject. Given our hypotheses, a pool of subjects that live in more unequal societies must exhibit a low treatment effect. Alternatively, a pool of subjects that live in more equal societies must exhibit higher treatment effects from our protocol.

Lastly we would like to emphasize that even though our desing draws a causal relationship between the affects inherent to inequality and productivity, we cannot overrule the presence of behavioral factors that could mediate or motivate this relationship in the aggregated data. Whether inequality aversion could be higher motives of affects variation remains yet to be studied in a protocol that could abstract from the affective channel.

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Appendix 1: Experimental instructions

This is an experiment in the economics of decision-making. The instructions are simple and if you follow them carefully you might earn a considerable amount of money, which will be paid to you via Bank transfer at the end of the experiment. The amount of payment you receive depends on your decisions. The currency used in the experiment is Euros.

Once the experiment has started, no one is allowed to talk to anybody other than the experimenter. Anyone who violates this rule will lose his or her right to participate in this experiment. If you have further questions when reading these instructions please do not hesitate to raise your hand and formulate the question to the experimenter.

What do you have to do? First we would like you to watch a video clip. The video will be displayed in your computer screen. Please make yourself comfortable: the clip will last about 10 minutes and I will have more instructions for you afterwards. Donâ€™t forget to use the provided headphones.

[10 minutes: Video]

Thanks for watching, please fill out questionnaire 1 in and answer it to the best of your ability. When you are all done we will move to the next stage.

For the next task we will ask you to move your keyboard far from your reach. Now, you will have ten rounds of two minutes each to position 48 sliders at the exact middle using only the mouse. This is, you need to use the mouse to move the indicator of the slider until the digit located at the right is 50. You will be paid 10 cents per correctly positioned slider. Using the keyboard to complete the task is forbidden, anyone using the keyboard will be asked to leave the room. An example is provided

Please fill in the last questionnaire, answer as truthfully as you can and feel free to raise your hand if anything is unclear. Please note that as with the rest of your input today, your questionnaire answers are entirely anonymous: we will only link your answers to the specific computer ID which you were randomly allocated at the start of today's proceedings. I would also like to stress that your payment does not depend upon your questionnaire answers. When you are done with the questionnaire please save the document.

[Untimed (allow around 10 minutes): Questionnaire]

I will ask you to remain seated since you will need to sign a receipt for your payments.Many thanks for taking part in today session.

Appendix 2: PANAS Questionnaire

This scale consists of a number of words that describe different feelings and emotions. Read each item and then list the number from the scale below next to each word. Indicate to what extent you feel this way right now, that is, at the present moment

Scare: 1 - Very Slightly, 2- A little, 3- Moderately, 4 -Quite a bit 5- Extremely

1. Interested : 1 2 3 4 5
2. Distressed : 1 2 3 4 5
3. Excited : 1 2 3 4 5
4. Upset: 1 2 3 4 5
5. Strong : 1 2 3 4 5
6. Guilty : 1 2 3 4 5
7. Scared : 1 2 3 4 5
8. Hostile : 1 2 3 4 5
9. Enthusiastic : 1 2 3 4 5
10. Proud : 1 2 3 4 5
11. Irritable: 1 2 3 4 5
12. Alert: 1 2 3 4 5
13. Ashamed : 1 2 3 4 5
14. Inspired : 1 2 3 4 5
15. Nervous : 1 2 3 4 5
16. Determined : 1 2 3 4 5
17. Attentive: 1 2 3 4 5
18. Jittery : 1 2 3 4 5
19. Active: 1 2 3 4 5
20. Afraid : 1 2 3 4 5

Appendix 3: Socio-Economic Status Questionnaire

1. Gender: M F

2.Age:

3. Actual Education Degree: Bachelor Master

4. Do you come from a rural area?: Y N

5. How do you finance your studies? Scholarship , Loan , Parents , Side Job, Other.

6. In which country where you born?

7. Have you ever lived in a developing country? Y N

7. How long have you lived in a developing country (years)?

8. Have you traveled to a developing country? Y N

9. How many times have you traveled to a developing country?

10. Have you ever worked for a charity organization that helps poor people? Y N

11. How many real estate properties do your family own?

12. What is the highest degree that your father achieved? Elementary School , High School , University, Master, PhD.

13. What is the highest degree that your mother achieve dElementary School , High School , University, Master, PhD.

14. How many cars do your parents own?

15. What is the current labor status of your father: Unemployed, Self-Employed, Partime, Employed, Fulltime Employed, Retired.

16. What is the current labor status of your mother: Unemployed, Self-Employed, Partime, Employed, Fulltime Employed, Retired.