

THE INTERACTIVE NATURE OF WORK INCENTIVES

Till Gruene-Yanoff and Lars Lindblom

Work plays an important part in how our lives turn out. Unsurprisingly, considerable effort has been put into developing strategies to improve our lives through improving work. Many of these efforts envision a world in which the quality of work is enhanced for everybody, or at least for a majority of people. Suggestions range from ‘self-activity’ (Gorz 1999), ‘civil labour’ (Beck 2000), ‘re-appropriation of time’ (Centre de Jeune Dirigantes) and ‘the third sector’ (Rifkin 1995) to ‘Neue Arbeit’ (Bergmann 2004). Quality of work often is characterised as a balanced work/leisure mix, as the autonomy it bestows on workers in pursuing their tasks, as the challenges it poses and the creativity it inspires, as the relative equality between workers it generates, and by the self-expression it allows. All these qualities of work are considered lacking to some degree in the current world of labour, or are expected to be lacking in a future state of the world that is projected from current trends.

Various methods to bring about such improvements have been examined. A crucial part of these investigations are accounts of why the current or projected deficits are so stable that they require the proposed interventions. In this context, it is often claimed that people are prevented both from appreciating and from implementing possible improvements by ‘tradition’ or ‘the work ethic’:

‘In our culture, a deeply rooted tradition prevents us from considering work as something exquisite or even delightful’ (Bergmann 2004, 13).¹

Bergmann depicts this tradition as something that affects our assessments and evaluations: people under the influence of this tradition neither appreciate the jobs they are currently holding down, nor are they able to envision a kind of work they could really cherish. At the same time, he portrays this tradition as something outside of us, a ‘monstrous powers that clutch us like a vice and that seem unrelentingly bound to drag us down into the gaping abyss’ (Bergmann 2004, 52).² It seems as if someone let a tentacled monster

-
1. ‘es gibt in unserer Kultur eine tief verwurzelte Tradition, die uns daran hindert, Arbeit als etwas Köstliches und sogar Wunderbares anzusehen’ (our translation from the original German).
 2. ‘wenn da nicht diese monströsen Kräfte wären, die uns umklammert halten wie ein Schraubstock und die unbeugsam entschlossen scheinen, uns alle in einen gähnenden Abgrund fahren zu lassen’ (our translation)

out of the cage, and it now holds workers in the joyless jobs that they are in.

We think that this account is a misleading analysis of the stability of the *status quo*. As we will show in this paper, even if many workers are aware of possible changes in the quality of their work, and even if all workers prefer those changes to the *status quo*, they may be in a situation that prevents them from implementing these changes. The cases we present show that the stability of the status quo is neither a consequence of individuals failing to appreciate what they really want, nor brought about by some extraneous power independent of the involved people's preferences and interactions.

Our interest in this matter is not confined to this theoretical question. Rather, we are worried about the recommendation for action that is implied by this analysis. What many authors seem to suggest is a concerted effort to change people's mind about work:

'Something has to change not only in office workplaces, or in law and politics, but above all in people's (men's) heads. The idea that social identity and status depend only upon a person's occupation and career must be taken apart and abandoned, so that social esteem and security are really uncoupled from paid employment' (Beck 2000, 58).

Beck, and similarly Bergmann, seem to say that the improvement of work crucially depends on changing people's minds. This claim is ambiguous in several ways: it may refer to expanding people's concept of work – in effect, providing a new option to their work alternatives – or it may refer to changing people's attitudes towards existing alternatives. We show that – at least in certain cases – neither a provision of new work concepts nor a change of people's preferences will bring about an improvement of work quality. To the contrary, the agents in our scenarios are fully aware of the alternatives, including the ideal work conditions, and they all prefer the ideal work conditions to the *status quo*. Still, due to the interaction required to bring about this change, they do not manage to realise what they know is an alternative, and in their opinion, better option. The claim is also ambiguous in another sense. It may mean that what is needed is a change in individual's preferences and consequently a change in the choices employees make in the workplace. This is how we understand Bergmann and it is also a natural interpretation of Beck. We call this the mentality interpretation. This is the idea that we argue against in this paper. However, there is another interpretation of the claim, which says that what is needed is a change of political ideals, so that appropriate institutions can be put in place.³ We call this the

3. Rifkin (1995) and Gorz (1999) each put forward arguments of this kind. They say that as the macro conditions of the economy has changed in such a manner that full

political interpretation. We find this an important point and view this paper as giving indirect support for this standpoint.

We use simple modelling techniques familiar from economics to make our argument. We develop scenarios where individuals from a large population interact (for example, the employees of a large firm, medical students after their final exam seeking a first position, or job seekers at an unemployment agency). People interact one-on-one with each other, and all have the same chance of interacting with all the others from the same pool. Their interaction consists in each individual choosing a strategy; the outcome of the interaction is jointly determined by the strategies chosen by *both* individuals (this interaction does not have to be face to face. For example, job applicants interact when they send an application letter for the same job). Such interactions are typical for the labour world, where success is often determined relative to others, and where the quality of the work process and work result often depends on the collaborative effort in a team. In contrast to the real world, where outcomes consist of complex mixtures of work properties (incomes, leisure, autonomy, challenge, creativity, self-expression, etc.), we construct scenarios with outcomes that vary only with respect to one property. This, first of all, makes the model scenarios more manageable and comprehensible. Additionally, it helps us to show that for *each* of these properties, the nature of the interaction prevents the realisation of the ideal work situation.

We focus on the ideals on leisure, autonomy and equality and investigate each scenario with the following question in mind: which strategies will agents prefer, and hence which will they choose? Each individual ranks the interaction's possible outcomes according to her preferences. Because outcomes are jointly determined by both individuals' strategy choices, however, preferences over outcomes do not directly translate into preferences over options. Instead, individuals determine their preferences over strategies in a simple trial-and error learning process. The first time they interact with another agent from the pool, they choose a strategy at random. After each interaction, each agent checks whether, given her opponent's choice, she could have obtained a better outcome (in the light of her own preferences) by choosing differently. If yes, she adopts this strategy for her next

employment is no longer possible, we should think of work in a wider sense than standard employment. But they say this, not because they believe that individuals are mistaken in their private choices. Rather, their point is that with ideals such as third sector work, we are in a better position to implement policies that handle these new economic realities in a manner that supports democracy and self-esteem. On these theories the change of the ideal of work ought to take place foremost in the political arena.

interaction.⁴ With all individuals in the pool being involved in interactions repeatedly, a stable pattern may emerge: either, all agents learn to choose the same option in all their interactions; or, while individuals may continue changing their options in different interactions, the proportions with which options are chosen over the whole population remains stable. Which patterns emerge depends on the strategies available to the jobseekers, and the outcomes of the interactions.⁵

In each of the following scenarios, we show that despite every individual preferring an outcome O with an improved work quality, either (i) O is never reached in the equilibrium state, because the strategy leading to O is not evolutionary stable, or (ii) in the evolutionary stable state of the population, strategies are played that at least some of the time realise outcomes different from O . In both cases, at least some of these stable interaction patterns yield outcomes that all consider worse than O . Our scenarios therefore show that despite knowledge of better alternative, and despite preferences for those better alternatives over the status quo, agents are sometimes unable to realise such alternatives. Policies that focus on changing people's minds in order to improve working conditions in these conditions would fail.

1st Scenario: Work vs. Leisure

Imagine a population of work-seeking agents. Agents consist of two types. The first type (H) exhibits the 'standard work' strategy: she takes work as the centre of her workday life, accepts long work hours, and leaves work only to relax, eat and sleep. If H gets work, she receives salary S .⁶ The second type (L) lives his life according to the 'new work' strategy: he takes

-
4. This learning process can be modelled more generally by assuming that imitation occurs with a certain probability. Because the results of this paper are not affected by it, we restrict ourselves to the simpler version.
 5. Without spelling them out in detail, we are making use of the concepts of evolutionary game theory in our analysis of the situation. Essentially, we investigate the described strategies for their evolutionary stability. Showing that a certain strategy is the only pure evolutionarily stable strategy (ESS) in that situation implies that after sufficiently many rounds of trial-and-error, all agents will play only this strategy (Compare Hofbauer/Sigmund 1998). In case this ESS is a mixed strategy, after sufficiently many rounds of trial-and-error, the proportion of agents playing a pure strategy included in the mixed ESS will be equal to the probabilities of the mixed strategies (for the equivalence (in 2×2 games) of all agents in a homomorphic population playing a mixed ESS and agents in a polymorphic population playing different pure strategies with the specified proportions, see Smith 1982, 17).
 6. Let's assume that everybody prefers more salary to less.

work as just one feature of life, next to other more meaningful activities. He therefore agrees to a work contract only if it contracts less than a certain number of hours. Because L works less than H , he only gets salary αS with $\alpha < 1$. But he receives a bonus P from his other life activities, no matter whether he draws a salary or not.⁷

We assume that prospective employees always compete in pairs for a job. That is, only two work-seekers call on a potential employer. A work-seeker will get the job depending on her type, and on the type of the other work seeker she competes with. We can represent this competition in the matrix of Fig. 1, where the rows represent the possible types of one competitor, called 'ROW', while the columns represent the possible types of the other competitor, called 'COL' (of course, because all competitors come from the same population, the situation is symmetric – ROW and COL type is drawn from the same set, and each faces the same outcomes for the same interactions).

	H	L
H	$1/2S, 1/2S$	S, P
L	P, S	$1/2(\alpha S + P), 1/2(\alpha S + P)$

Fig. 1

Employers prefer workers willing to commit to long hours, hence the one willing to work longer gets the job. That is, if an H type ROW competes with an L type COL, ROW gets the job, and receives salary S , while COL receives only P (the notation is such that the first outcome always signifies ROW's payoff, while the second signifies COL's payoff). If two agents of the same type compete, the employer chooses at random, hence each of them receives the job with probability $1/2$. That is, the expected outcome for H types in this situation is $1/2S$, while for L types it is $1/2(\alpha S + P)$.

In our scenario, we assume that everybody prefers the lower salary of part-time work combined with the bonus of extra leisure time to the higher salary of full-time work. In other words, all agents prefer a world in which everybody is of type L to a world where everybody is of type H . In our nota-

7. This bonus may be measured in quality of leisure time, material outcomes of leisure time activity, happiness index, or some such. Let's assume that this measure is preference-comparable with salary S . That is, if and only if $S > B$, then the outcome S is preferred to the outcome P . Further, let's assume that the two measures can be added, such that e.g. if $S_1 + P_1 > S_2$, then the outcome yielding $S_1 + P_1$ is preferred to the outcome S_2 .

tion, this assumption is expressed as $1/2(\alpha S + P) > 1/2S$, or $P > (1-\alpha)S$. We call this the ‘progressive attitude’ assumption.

As it turns out, progressive attitudes do not ensure that everybody will in fact become a work-seeker of type L . Imagine a population with many L types and some H types (technically, it is enough for our case if there is a single H type in the whole population, like a [predator in a prey school]). If in such a population an L type ROW competes with an H type COL, ROW gets P and COL gets S . Let’s look at this result from ROW’s perspective for a moment. For her, the type of her competitor is a given. All she can do to get the best out of the situation is to change her own type. As an L , she gets P ; as an H , she gets $1/2S$. Therefore, if $1/2S > P$, she would be better off being an H type. Given that ROW learns from her experience, she will conclude that competing as an H type is better for her than competing as an L type. Hence, the next time she interacts with another jobseeker, she will compete as an H type. The interaction between these two players has thus ‘converted’ an L type into an H type. If interactions are continued in this kind of population, the H types will ‘convert’ other L types, until the whole population consists only of H types. Importantly, this result is compatible with the progressive attitude, as long as $\alpha > 1/2$.⁸ This is a plausible assumption, as most part-time work schemes reduce work time by less than half.⁹ Thus, if agents do not value leisure too highly ($1/2S > P$), and desire to take off less than half of their standard working time ($\alpha > 1/2$), a population with only one H type will eventually develop into a population consisting solely of H types, although *everybody* (including the H types themselves) prefers a pure L type population to a pure H type population.

An even stronger result can be obtained. Let’s imagine that P is larger than $1/2 S$. Thus, when competing against an H type, ROW will actually be better off remaining the type she is. However, if she competes with an L type, and S is larger than $1/2(\alpha S + P)$, then she will be better off in that situation to become an H type. Thus, whenever ROW interacts with a competitor of her own type, she will change types after the interaction; while she retains her type after an interaction with a jobseeker of a type different from herself. If interactions are continued in this kind of population, the proportions of H types and L types in the population will become stable (even though individual jobseekers will keep on changing their types).¹⁰

8. For ROW to prefer playing H over L , given that her competitor plays H , it must be the case that $1/2S > P$. According to the progressive attitude assumption, $P > (1-\alpha)S$. For both conditions to hold, $1/2S > P > (1-\alpha)S$, i.e. $1/2S > (1-\alpha)S$, or $\alpha > 1/2$.

9. Reference needed.

10. Type H will have proportion $r_H = \frac{\alpha \times S - P}{\alpha \times S + P}$ and type L proportion $r_L = 1 - r_H$. For the solution process, and for the identity of mixed ESS and stable evolutionary strategies, see Smith (1982), 9-20.

Note, first, that this case exists for all α .¹¹ Note, second, that this result is compatible with the progressive attitude for all α .¹² Thus, if everybody values leisure higher than in the previous example, but not too highly ($(2-\alpha)S > P$), a proportion of the jobseeker population will always compete as H types, despite *everybody* preferring a pure L type population to a pure H type population.

Our scenario provides an analysis of the relative absence of freedom of choice in the number of hours worked. According to the progressive assumption, all jobseekers prefer working shorter hours; but all that they are offered in the labour market is either working long hours or not working at all. Fig. 2 depicts the standard supply-demand model of the labour market. The functional graph represents a worker's trade-off between the hours of leisure not spent in gainful employment (L on the X-axis) and consumption possibilities that the earned wage provides (C on the Y-axis). The straight line BA represents the demand for labour: the more hours a worker works, the higher the wage she takes home. At point B , she works all her possible working hours; at point A , she spends all her possible working hours as leisure time and consequently does not work at all. The convex curves represent the worker's indifference curves.¹³ The optimal work-leisure choice for a specific worker is the tangential point E of the demand curve and her indifference curve.

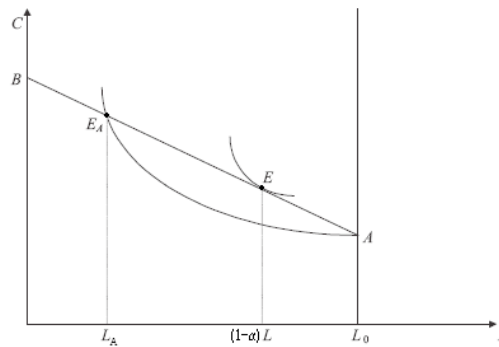


Fig. 2: Labour Demand and Supply

11. From $S > 1/2(\alpha S + P)$ follows $(2-\alpha)S > P$. From this and $P > 1/2S$ follows $(2-\alpha)S > P > 1/2S$. This interval exists for all $1 > \alpha > 0$.
12. The condition for this result is $(2-\alpha)S > P$. The progressive attitude assumption requires $P > (1-\alpha)S$. $(2-\alpha)S > (1-\alpha)S$ is satisfied for all α .
13. An indifference curve connects alternatives between which an agent is indifferent. Standardly, when comparing two points that are not on the same curve, the further a point is away from the origin, the more preferred it is.

Our scenario analyses why E may not be attainable, even though the demand curve is a continuous line. Let E be the point where the job seeker would work α hours (and hence has $L_0 - \alpha$ hours of leisure). As represented by the indifference curve, she prefers E to points on the demand curve that offer longer or shorter hours of work. However, due to the competitive pressure analysed above, she cannot get a job with these hours: her competitors will offer longer working hours, and employers prefer workers with such qualities. Most likely, she will have to bow to this pressure, as labour markets commonly exhibit excess labour supply (Shapiro and Stiglitz 1984). Consequently, if she wants to work at all, she will have to accept working longer hours than she desires. This offer is only limited by her indifference curve $E_A A$: at E_A , she is indifferent between working $L_0 - L_A$ hours, and not working at all. If her competitors have indifference curves that cross the demand line to the left of E_A , they are willing to offer even longer hours than her, and she will be pushed out of the labour market entirely. If this is not the case, then she will be able to get a job, but only by offering considerably longer hours than she considers optimal.

Speaking casually, it seems that until recently, employees in most industrialised nations found themselves in a situation like the pure H -type population: many wanted to work less and to pursue a multi-activity lifestyle, but were forced to either conform or face involuntary unemployment. More recently, the rate of part-time work in some EU countries has risen considerably (OECD 2006, Blanchard 2006), while many still work longer hours than they would like. Hence, one may conclude that these countries are entering a situation more like the mixed stable state.

Within such a simplified world, workers are subject to forces larger than themselves, which arise out of this competition with other workers. These are forces that, pace Bergmann, cannot be overcome by simply changing peoples' individual preferences. Depending on the payoffs they receive from work, and following what they think are their best interests, people may end up in a society whose organisation of work they do not want. Changing their attitudes towards work does not help here: they already have preferences for being type L in a group of other L s, and therefore need no preaching to the effect that such a behaviour would be desirable.

2nd Scenario: Autonomy

The work qualities that concern the reformers not only comprise the hours worked and the way leisure is planned and enjoyed. They also propagate new ways to work autonomously, accept work challenges and promote self expression. The following scenarios show that also in these aspects, the

structure of workers' interactions may prevent a smooth transition from the 'old' paradigm of non-autonomous, non-self-expressing and challenge-avoiding behaviour to the 'new' paradigm of improved work qualities.

We start with the case of autonomy. Imagine a population of workers who have to master a task in a team. The team can be loosely organised, allowing each worker some discretion as to how to perform the task. Alternatively each worker may be given detailed and strict instruction show to perform it. The organisation of such teams often depends on the type of the workers. If they are willing (and able) to take on tasks with a certain autonomy, then the team will be structured accordingly; if they only work 'on command' (we call this 'contingent work'), then the team structure will eventually be very hierarchical and without autonomous scope.

The reformers claim that working autonomously for many people is more fulfilling than working contingently. We can grant them this claim by letting individual agents prefer autonomous work (AW) over contingent work (CW). We can even admit that autonomy will under the right circumstances leads to higher productivity.¹⁴ But here's the flipside of autonomous work in a team: team members, even if they prefer autonomous to contingent work, may free-ride on other team members' efforts. This is possible, first, because autonomous work involves taking on the responsibility for finishing a task. Those perceived as a little more 'eager' than others in their autonomous work efforts may take on informal leadership roles that credits them with the responsibility of the project. Other team members may then reduce their contributions to a level convenient for them, but overburdening those who are credited with informal leadership. This is possible, second, because team members' contribution may be difficult to monitor, if superiors delegate a task to a loosely organised team. This possibility becomes threatening for the introduction of work autonomy if free-riding is preferred by some team members over autonomous work. For two workers interacting, such a situation is depicted in Fig 3.

	AW	CW
AW	3,3	2,4
CW	4,2	1,1

Fig. 3

Here, both workers prefer the results from autonomous teamwork (AW,AW) to the results of contingent teamwork (CW,CW). Hence, the progressive at-

14. See for instance Dell (1993) or Pepitone (1998).

titude assumption is satisfied. However, each worker prefers the result of working contingently while her co-worker takes care of the task completion (CW,AW), to the results from autonomous teamwork (AW,AW). Last, each worker prefers the results of working autonomously while her co-worker relies on her (AW,CW) to the results of contingent teamwork (CW,CW).

Thus, a worker of type AW interacting with another worker of type AW will find that she can do better for herself by switching type. But similarly, a worker of type CW interacting with another worker of type CW will find that she can do better for herself by switching type. Repeated interactions amongst workers from the same population (a large firm, say) will therefore not bring about a population of only one type. Rather, they will bring about a stable state in which a fixed proportion of workers interacts according to CW . Thus, despite everybody preferring a pure AW -type population over a pure CW -type population, both types remain in the population.

3rd Scenario: Equality

An important aspect of work life concerns status. Status is conferred by one's boss, one's colleagues or the customers. Undoubtedly, status is closely related to the actual performance and results of one's work, and hence how well one does as a team. But raise of status can also be achieved by playing against the team: as witnessed by the behaviour of those who constantly push themselves in the foreground, who insist on the most visible part of a task, and who shirk tasks where no glory is to be had. Those who play the status strategy (S) aim at achieving a higher status than their team-mates, whereas those playing the equality strategy (EQ) intent to work on equal terms with others. An interaction of two workers can thus lead to four possible outcomes, as depicted in the following matrix.

	S	EQ
S	1,1	3,0
EQ	0,3	2,2

Fig. 4

When two S -type workers meet, there is obviously a conflict over status. If two EQ -type workers meet, there is work on equal terms. However, when workers of different types meet, the S type is able to exploit the EQ type. Because of its disruptive effects on the team, and its inherently exploitative nature, it can safely be assumed that everybody prefers a world only

of EQ-types to a world only of S-types. Thus the progressive attitude requirement is satisfied. Nevertheless, encounters between EQ and S types lead to the conversion of S types, and eventually to a population of only S types. Imagine a recent university graduate entering the workforce, viewing employment as a contractual relationship on equal terms. When she finds that a colleague is taking advantage of her, she tries to have policies passed that stops her colleague's taking of advantage, and she also start taking advantage of her colleague when she can in order to get even. When the next graduate enters the company she continues to play for status, because she has made up her mind not to be taken advantage of again.

Conclusion

The cases we discussed in this paper show that the stability of the *status quo* is neither a consequence of individuals failing to appreciate what they really want, nor brought about by some extraneous power independent of the involved people's preferences and interactions. Instead, despite the fact that everybody subscribes to the progressive attitude, these progressive alternatives often are not implemented.

As we showed, it may well be the case that people know what the alternatives are, in the sense that they have a concept of the 'space of possibilities'. They may also know their preferences; their preferences may even considerably differ from the work and the work style they are engaged in. Nevertheless, they may be trapped in a situation where what they want is unreachable to them, through the constraints imposed by competition with others, and leaving the workforce altogether is even less preferred than the *status quo*.

Our method is entirely restricted to the confines of the armchair. We discuss highly simplified scenarios that depict plausible interactions between workers. They do not represent any particular real-world situation. Nevertheless, we think that the plausibility of the presented scenarios allows us to draw conclusions about the concept of work improvements: while previous theories have presented such improvements as a matter of changing people's minds, we show that for plausible cases, the mentality interpretation provide a misleading analysis. If, through empirical research, these plausible cases can be shown to exist in the real world, then our armchair analysis also becomes relevant for practical recommendations: it shows that in order to bring about work improvements, changing people's minds will not do.

References

- Beck, Ulrich (2000): *The Brave New World of Work*, Cambridge: Polity Press.
- Bergmann, Fridtjof (2004): *Neue Arbeit, Neue Kultur*, Freiamt im Schwarzwald: Arbor Verlag.
- Blanchard, Oliver (2006): 'European Unemployment', in: *Economic Policy*: 5–59.
- Cahuc, Pierre/Zylberberg, André (2004): *Labor Economics*, Cambridge/MA: MIT Press.
- Dell, Twyla (1993): *Motivating at Work. Empowering Employees to Give Their Best*, Menlo Park: Crisp Publications.
- Gorz, André (1999): *Reclaiming Work. Beyond the Wage-Based Society*, Cambridge: Polity Press
- Hofbauer, J./Sigmund, K. (1998): *Evolutionary Games and Population Dynamics*, New York: Academic Press.
- OECD (2006): *OECD Employment Outlook 2006*, Paris: OECD.
- Pepitone, James S. (1998): *Motivating Employees*, New York: McGraw-Hill Professional Book Group.
- Rifkin, Jeremy (1995): *The End of Work. The Decline of the Global Labor Force and the Dawn of the Post-Market Era*, New York: Putnam Publishing Group.
- Shapiro, C./Stiglitz, J. (1984): 'Unemployment as a Worker Discipline Device', in: *American Economic Review* 74:3, 433–444.
- Smith, John Maynard (1982): *Evolution and the Theory of Games*, Cambridge: Cambridge University Press.