

This is the final draft of a chapter that has been accepted for publication in: N. A. Vincent, T. Nadelhoffer and A. McCay (eds.), Neuro-Interventions and the Law: Regulating Human Mental Capacity, New York: Oxford University Press (2020), 375-405. Please cite the published version.

NEUROENHANCEMENT, COERCION, AND NEO-LUDDISM

Alexandre Erler

Abstract:

This chapter addresses the claim that, as new types of neuro-intervention get developed allowing us to enhance various aspects of our mental functioning, we should work to prevent the use of such interventions from ever becoming the "new normal", that is, a practice expected – even if not directly required – by employers. My response to that claim is that, unlike compulsion or most cases of direct coercion, indirect coercion to use such neuro-interventions is, *per se*, no more problematic than the pressure we all find ourselves under to use modern technological devices like computers or mobile phones. Few of us seem to believe that special protections should be introduced to protect contemporary “Neo-Luddites” from such pressures. That being said, I acknowledge that separate factors, when present, can indeed render indirect coercion to enhance problematic. The factors in question include lack of safety, fostering adaptation to oppressive circumstances, and having negative side effects that go beyond health. Nonetheless, I stress that these factors do not seem to be necessary correlates of neuroenhancement.

1. Introduction

The ethical debate on the practice of “neuroenhancement” has become a major trend in the field of neuroethics in recent years. Neuroenhancement refers to the use of a range of techniques – often biomedical technologies, which will be the focus of this chapter – by healthy people with the aim of improving their mental abilities and affective dispositions (as opposed to treating a disease or mental disorder, the purpose for which these biomedical technologies were developed in the first place). One of the most widely discussed examples of such a practice has been the use of psycho-stimulants like amphetamine (Adderall), methylphenidate (Ritalin) or modafinil (Provigil) by students on various University campuses looking for a study aid (see e.g. Greely et al., 2008). Such substances are sought for their purported beneficial effects on concentration, memory, and wakefulness, but also, as has recently emerged, because they

increase some users' energy levels and motivation to engage in academic work (see e.g. Vrecko, 2013; Ilieva and Farah, 2013).¹ In this regard, psycho-stimulants are proving more similar than previously thought to another kind of intervention that had been discussed even earlier, namely the enhancement of mood and personality using antidepressant drugs like Prozac. Psychiatrist Peter Kramer kick-started the ethical debate on this latter practice with his book *Listening to Prozac*, in which he reported anecdotes of formerly depressed patients who, even after they had gotten better (or so he reports), requested to stay on the drug on grounds that it gave them (among other things) a more socially appealing personality – for instance, more extroverted, and less prone to negative affect (Kramer, 1993).² More recently, increasing attention has also been given to various forms of brain stimulation, such as transcranial magnetic stimulation (TMS) and transcranial direct current stimulation (tDCS), which in addition to their relevance for the treatment of conditions like depression and schizophrenia, show the potential to enhance both mood and cognitive functions like memory, mathematical ability, and language learning (Cohen Kadosh et al., 2012; Coffman et al., 2014; Meinzer et al., 2014; Santoni de Sio et al., 2014). Other interventions have also been discussed, such as the prospect of technologically improving people's *moral* dispositions, e.g. by reducing racial bias or the propensity to violent aggression (Douglas, 2008 and 2013; Harris, 2011; Focquaert and Schermer, 2015). More futuristic forms of neuroenhancement include neural implants that would allow us to connect our brain directly to computers, thereby allowing our cognitive capacities to benefit from the exponential gains that have characterized machine intelligence for the past half-century at least (Kurzweil, 2005).

¹ To be precise, we ought to distinguish among such effects between those that involve performance *enhancement*, and those involving performance *maintenance* (Ranisch et al., 2013). The former category of effects allow the user to reach a level of performance that she could not reach otherwise (e.g. to remember a greater amount of information than she could without the enhancement). Effects of the latter category, by contrast, prevent one's performance level from deteriorating in the face of detrimental factors like fatigue. For the sake of simplicity, I will use the term « neuroenhancement » to cover both performance enhancement and performance maintenance.

² Though Kramer's book raises fascinating philosophical questions and may well foreshadow what will become possible in the future, let me note however that his heavy reliance on personal anecdotes (rather than on large-scale data from peer-reviewed studies) should make us cautious before assuming that the sort of durable personality enhancement he describes is truly something we can already achieve today, whether with Prozac or any other current method.

One of the main ethical concerns that have been raised about neuroenhancement interventions, and the one on which the present chapter will focus, is the issue of *coercion*. The notion of coercion comes in a variety of forms, so a few conceptual clarifications are in order here. First, in the context of the neuroenhancement debate, it is common to distinguish between *direct* and *indirect* coercion (Greely et al., 2008; Farah, 2012; Dubljevic, 2013). A paradigm example of direct coercion to enhance would be an employer making the willingness to use neuroenhancers an explicit requirement of a particular position (see the contribution by Hopkins and Fiser in the present volume): imagine a job description stipulating that “the successful candidate will be willing to use [neuroenhancer X] when necessary”. The requirement need not necessarily be explicit, however. As long as a company manager, for instance, expected all of her employees to use neuroenhancers, even if he never stated his expectation in an “official” manner (but, say, solely relied on hints), direct coercion would be present. In cases of indirect coercion, by contrast, no one is enforcing an actual requirement to enhance, whether explicit or implicit. The pressure to enhance does not come directly from a recognized authority, but is rather the by-product of something else, such as expectations about productivity. Suppose that some neuroenhancer successfully boosts productivity in some particular activity, and that a number of people are using it for that purpose. If an employer tends to hire the most productive people in that area, while having no particular expectations about neuroenhancement use itself, all applicants for this type of job will nevertheless find themselves – indirectly – under pressure to take neuroenhancers to increase their competitiveness.³ This second, indirect form of coercion is the one that a number of students report being faced with in relation to psychostimulant use, in their quest to get good grades (e.g. Forlini and Racine 2009; Partridge et al., 2013).

³ At least all those who do not already enjoy (say, because of natural talent) a competitive advantage so great that they can expect to remain ahead even if their less talented competitors start using neuroenhancers, and they do not.

Secondly, it is also useful to distinguish between what I shall call “unconditional” and “conditional” coercion. Unconditional coercion, as I shall define it, occurs when someone is forced or pressured to use some intervention in circumstances where one could not reasonably be expected to defy the pressures and refuse to use that intervention. Unconditional coercion on my definition does not entail that a person simply has no choice about whether or not to accept some form of neuroenhancement – this would represent *compulsion*, a more extreme scenario. Rather, in cases of unconditional coercion, one can still make that choice, but the alternatives to enhancement are all highly undesirable, to the point that one cannot reasonably expect the agent to embrace any of those alternatives.⁴ To illustrate, suppose that, as some authors believe might become appropriate in the future (e.g. Persson and Savulescu, 2008), we were to make it a legal requirement for everyone to undergo moral enhancement using biomedical means, on the grounds that this were necessary to avoid a global catastrophe. There are various ways in which we could implement such a requirement. We could for instance punish non-compliance with imprisonment: this would be an example of unconditional coercion in my sense (one would still have the choice to resist the enhancement by going to jail, although hardly anyone could reasonably be expected to make it and face its consequences). Alternatively, though this would be even more difficult to defend, we could put a moral enhancement drug into the water supply, unbeknownst to consumers (so that no one could decide to escape the drug by drinking only bottled water), or we could force-feed it to those who refused to take it. These latter two courses of action would constitute compulsion (avoiding taking the drug would not be an option at all). Most would agree that compulsion to enhance would be ethically wrong, except perhaps in highly exceptional circumstances, which is why I will not discuss it very much at all in this chapter.

Conditional coercion, on the other hand, concerns cases in which the pressure to use the relevant intervention occurs in the presence of at least acceptable alternatives for the agent, so that she *can* reasonably be expected to pursue one of those alternatives if she does not wish to undergo the intervention. The

⁴ I thank Nicole Vincent for helping me see the significance of this distinction.

inability to work for a certain company because one refused to use neuroenhancers, in the example cited above, would thus represent an instance of conditional coercion in my sense – provided that other acceptable careers that did not require the willingness to enhance were available to that person (otherwise, we would have crossed the line into unconditional coercion).⁵ Let me add that it is only appropriate to talk about someone being conditionally coerced (or facing conditional coercion) in cases where the person does *want*, for example, to exercise the profession for which neuroenhancement is required. If someone had no interest in any occupation where such a requirement was present, it would seem inappropriate to say that this person was being coerced, even conditionally, to enhance herself, just because she would be ineligible for any such occupation given her rejection of neuroenhancement.

It is worth noting, however, that the distinction between unconditional and conditional coercion is not meant to imply the existence of a sharp dividing line between the two. Rather, paradigmatic cases of unconditional and conditional coercion represent two ends of a spectrum, with many intermediary cases in between. First, the number of acceptable alternatives to jobs that required neuroenhancement could be greater or smaller, and cases where many such alternatives were available would represent clearer instances of conditional coercion than cases where only one or two such alternatives were available (which would be much closer to unconditional coercion). Secondly, what counts as an “acceptable” alternative is certainly, to some extent, open to debate. For instance, imagine a situation in which neuroenhancement use has become a precondition of getting a University degree, because it is now so widespread that the bar for what counts as satisfactory academic work has been raised – to a level that hardly anyone can reach without the help of neuroenhancers. Would

⁵ Coercion to enhance could also come about *after* one had already embarked on a particular career, if the use of neuroenhancers gradually became expected from those pursuing such a career, even though this expectation wasn’t present originally. The coercion could either be conditional, if the person subjected to it could still reasonably be expected to transition to a different, sufficiently desirable career where neuroenhancement was not mandated; or unconditional, if such a thing could not reasonably be expected from that person. Furthermore, what was originally conditional coercion could also gradually become unconditional, if acceptable alternatives to the agent’s chosen career initially existed but eventually disappeared as enhancement made its way through society.

we then be dealing with conditional or unconditional coercion to enhance? Some might claim that the latter is true, arguing that a University degree has become all but a necessity in modern society and that the lack of it entails costs one cannot reasonably be expected to bear, whereas others might disagree, pointing to various careers that do not require a University education. Controversial cases are therefore possible. Still, the existence of a grey area does not mean that there are no clear-cut examples of each kind of coercion, such as those described in the previous paragraphs. A further, interesting question which I cannot explore in depth here is the extent to which the subjective perspective of the agent herself might determine what counts as an acceptable alternative. I will limit myself to suggesting that the agent's own judgment need not necessarily be decisive in this regard. We should at least make room for the possibility that someone might suffer from either: (a) false consciousness, and fail to recognize that the only options available to her were very poor ones (e.g. working conditions involving mistreatment); or (b) expensive tastes, leading her to discount options that the overwhelming majority of us would regard as perfectly acceptable (think of someone who refused to acknowledge any other profession than that of supermodel as a desirable career path).

In a professional context, occupations where use of idealized (and in some cases, already existing) neuroenhancers might plausibly become mandated or at least expected by employers seem numerous, in view of the various ways in which it could improve job performance. To give but a few examples, one study found that the drug modafinil had a beneficial impact on the memory and decision-making capacity of sleep-deprived doctors (Sugden et al., 2012). Similar benefits can be expected in other professions where sleep loss is a hazard, such as long-haul truck drivers, or where a sharp focus over extended periods is key, such as air traffic controllers.⁶ US military pilots who refuse to take amphetamines when

⁶ It is worth mentioning, however, that the extent to which currently available substances might be suitable in those contexts is a disputed matter: to take the example of truck drivers, stimulants like amphetamines are actually believed to *increase* the risk of traffic accidents (despite their benefits for wakefulness) due to their side effects, which can include agitation, tachycardia, and even hallucinations (Giroto et al., 2013). Modafinil, by contrast, seems to hold greater promise in this context (Krueger and Leaman, 2011), though some remain worried about its addictive potential (Heinz et al., 2012).

asked to do so can already be denied the chance to fly combat missions, with potentially damaging consequences for their career (Mehlman, 2004) – though the military is now reported to be turning to the safer alternative represented by modafinil (Mehlman, 2015). A caveat we ought to add here is that the likelihood that people will come under pressure to use neuroenhancers like modafinil partly depends on future advances in artificial intelligence and the automation of tasks that they allow. For example, self-driving trucks, which could drive for many hours with no breaks and while maximizing fuel efficiency, are already at an advanced stage of development, leading some to expect massive job losses among truck drivers in the relatively near future (Meola, 2016). In areas where technology can thus substitute for human workers, concerns about coercion to enhance may well prove irrelevant. That said, all occupations are not equally vulnerable to automation, and as long as humans are needed in the workforce, especially for complex and cognitively demanding tasks, the prospect of neuroenhancement will retain its appeal. In fact, this appeal might be increased if neuroenhancement can help people keep up with the performance levels attained by machines and thereby preserve at least some of their competitiveness in the face of automation.

When it comes to the technological manipulation of affect and personality, the correlation between the display of positive emotion by employees and customer satisfaction in virtually all forms of customer service is well established (e.g. Pugh, 2001), though it is worth noting that the authenticity of such displays appears to matter as well (Andrzejewski and Mooney, 2016). Insofar as employees high in traits like agreeableness and extroversion, and low in negative affect, tend to be preferred to others for such jobs, those who “naturally” fall short in those areas might feel the pressure to use neuroenhancers, which – should they prove able to produce such effects, at least in the future – would likely provide a more effective and reliable path to the desired qualities than more traditional methods of emotion management (Kramer, 1993). A conscientiousness enhancer might enjoy even broader appeal, given the demonstrated association between that trait and academic and job performance (Higgins et al., 2007).

When discussing neuroenhancement interventions in what follows, I shall assume that they are effective. Admittedly, as we have just seen, this is an assumption for which the current empirical evidence is mixed (depending for instance on the type of effect sought and on the context of use) when it comes to existing interventions, which means that my discussion will be speculative to some degree.⁷ In principle, coercion (both direct and indirect) to undergo such interventions could occur even if that assumption were mistaken – or at least the perception of it could, with similar consequences. Suppose it turned out, for instance, that the stimulants currently popular among some University students do not in fact help them achieve better grades but simply create a false perception that they do. As long as this perception was widespread enough, students could feel pressured to take those substances. If this were the case, however, the natural way to alleviate such pressures would be to run large-scale information campaigns about the ineffectiveness of psychostimulants as study aids, which would also highlight the risks (if any) that they posed to health, and could be combined with further disincentives depending on the magnitude of those risks. A further assumption behind my analysis is that the interventions in question are undertaken by competent adults on themselves; I shall leave aside their use on children, which raises additional ethical worries. Even focusing on the adult context, some people – philosophers and non-philosophers alike – worry that the spread of neuroenhancements throughout society could lead to the establishment of a “new normal” (Vincent and Jane, 2014), with most people coming under pressure to use those technologies, even if they would ideally prefer not to, on pain of facing significant social and economic penalties. The concern here seems to be that even indirect coercion of this kind would be ethically problematic in itself, which implies that we ought to take active steps to protect people from it, although this may not justify going so far as prohibiting others from enhancing themselves.⁸

⁷ In particular, there is currently little evidence that neuroenhancers like psychostimulants can be used by healthy people on a regular basis, rather than just occasionally, without ever losing their effect and fostering tolerance.

⁸ Authors who raise the coercion worry also include Farah, 2002; Caplan, 2003; Mehlman, 2004; Chatterjee, 2006; Appel, 2008; Forlini and Racine, 2009; and Dubljevic, 2013. Greely and

Is this concern about indirect coercion justified? I will suggest that it is not – at least not insofar as it entails that such coercion to enhance should worry us *per se*. I shall proceed by highlighting our attitudes towards existing forms of coercion to use technology, and by arguing that our stance on neuroenhancement needs to be consistent with those attitudes. While the fact that pressures to use neuroenhancers limit people’s freedom of choice does count in favour of countering such pressures, I will argue that this consideration is outweighed by the many benefits we could expect from a widespread adoption of neuroenhancement. If so, the value of personal freedom of choice and the badness of coercion are not sufficient, by themselves, to justify setting up any special safeguards to protect people against indirect coercion to enhance, whether conditional or unconditional. The advent of a “new normal” involving neuroenhancers thus need not, in itself, be of concern to us. That said, I will add two concessions. First, I agree that people’s right to bodily integrity demands that they should be protected from *compulsion* to enhance, as well as from most instances of *direct* coercion to do so (although there might be exceptions in that latter case). Secondly, I will acknowledge that *other* important considerations, distinct from coercion itself, can when present give us good grounds for introducing special legal safeguards even against *indirect* coercion. Furthermore, even when such safeguards are not warranted, it remains desirable to encourage, whenever possible, gestures of good will (e.g. the adoption of special accommodations) towards those who for whatever reason might not wish to use neuroenhancers. I will then conclude by responding to a few possible objections to my analysis.

2. Possible strategies against indirect coercion to enhance

Before considering whether the importance of protecting people’s freedom does warrant measures to forestall the rise of indirect coercion to enhance, let us

colleagues also mention it (Greely et al., 2008), but suggest – correctly, as I will argue later – that the need for safeguards against such coercion depends on the safety profile of the relevant interventions.

briefly consider some measures that might be introduced to that effect. The most radical one would obviously be an outright ban on the use of neuroenhancers by the healthy (while still allowing of course for therapeutic uses of those same substances or devices). In effect, this is already how drugs like methylphenidate or modafinil are regulated in the United States, since it is illegal to purchase them there without a prescription.⁹ While such regulation is chiefly the responsibility of governmental agencies like the Drug Enforcement Administration (DEA) and the Food and Drug Administration (FDA), there have also been private initiatives. In the academic context, Duke University thus set a precedent in 2011 by modifying their official policy on academic dishonesty in precisely such a direction: the “unauthorized use of prescription medication to enhance academic performance” was added to the types of act constituting cheating (Duke University, 2011). The type of proposal we are considering would require extending such restrictive measures (which ultimately would have to be government-enforced, rather than left to the discretion of private actors) to all neuroenhancement interventions, including some, such as tDCS, which are currently commercially available to the public (as illustrated by the much-discussed headset sold by company foc.us).¹⁰

One ethical difficulty that has been pointed out about this strategy is that, in order to protect the freedom of those who do not want to have to enhance themselves, it impinges upon the freedom of those who would like to use those interventions (Farah, 2002; Hall, 2004). Why exactly should the freedom of the former be given more weight than that of the latter? I shall argue later that a persuasive justification can be offered for such a difference of treatment, but that it needs to appeal to considerations distinct from freedom. The attempt at a full-fledged ban on neuroenhancement use would also face implementation challenges, given that the already existing black market would likely further expand, and that some people might still gain access legally to the relevant

⁹ Even though they are not regarded as equivalent in terms of their abuse potential, with methylphenidate being classified as a schedule II drug, and modafinil only as schedule IV (Sahakian and LaBuzetta, 2013, p. 148).

¹⁰ Whether such devices currently sold to the public do have enhancing effects has been contested. For instance, one study found that the foc.us headset actually had a *negative* impact on working memory (Steenbergen et al., 2016).

interventions for enhancement purposes either by faking the symptoms of a disorder, or by finding a doctor willing to facilitate their non-medical use. For the moment, nevertheless, let us keep in mind the possibility of outright prohibition for the sheer sake of preventing indirect coercion. What more moderate alternatives could we pursue?

Another option that has been suggested would involve some form of collective action: as workers and citizens, we could take a stand together against the demand for ever-increased productivity and the other social expectations that drive the use of neuroenhancers. Among other things, this would involve voluntarily refraining from using such interventions while the choice is still up to us (Forlini & Racine, 2009; Vincent & Jane, 2014).¹¹ However, given the strong interest that many have in becoming more effective at doing their job (and in having at least some other people become more effective too), whether for positional or non-positional reasons, one might doubt that the necessary critical mass of people could be won over to prevent indirect and conditional (and ultimately, perhaps even unconditional) coercion from arising – at least on the assumption that the appeal of neuroenhancers were not diminished by concerns about safety, or by prohibitive prices that could not be brought down.¹² If such voluntary initiatives are not viable, we might have to turn again to laws and regulations .

Thirdly, we could try to make the choice to enhance less appealing, while staying away from a ban, for instance by imposing financial (taxes) and regulatory burdens (licensing procedures) on those who chose to use the relevant interventions in the absence of a medical need (for such a proposal, see e.g. Dubljevic, 2013). A possible challenge for that strategy is that the choice to enhance, by contrast for instance with the choice to smoke, will often be driven

¹¹ For the sake of accuracy, let me note that these two articles are focused on the specific issue of *cognitive* enhancement. However, the points they make about the need to prevent coercion seem to apply just as well to other forms of neuroenhancement.

¹² In the latter case, coercion might still affect the few wealthy people who could afford the relevant interventions. Others would strictly speaking be protected from such coercion by their insufficient means, given that being coerced into doing something arguably presupposes being able to do that thing. This economically less advantaged group might instead simply suffer the consequences of such a new competitive disadvantage without being able to do anything about it.

by expectations of economic benefits. If neuroenhancers led to better work performance, which led to greater opportunities for career advancement and eventually to a higher income, then the burdens to be borne to use those interventions might merely represent an investment which could be expected to yield a high return once the employee has started reaping the benefits of superior performance. The burdens in question would thus have to be very heavy in order to deter a high enough number of people so as to forestall coercion (in which case the threat of increasing socio-economic inequalities might arise, if only the wealthy found it profitable to invest in neuroenhancement use). Furthermore, this proposal would again likely face the challenges of a black market, and of some people circumventing the economic burdens either by faking symptoms or with the help of “liberal-minded” doctors.

On reflection, we may question whether any of those strategies (or further alternatives that I may not have considered) would be successful in staving off the rise of indirect coercion to enhance. Let us, however, set those doubts aside, and assume that at least one of these would work well enough (which particular one might be superior is not crucial to the rest of my discussion). Would we then be justified in implementing it simply for the sake of protecting people from such coercion? I now want to defend a negative answer to that question.

3. Freedom, Neo-Luddites, and the “new normal”

Consider the attitude that our society appears to take towards those referred to as “Neo-Luddites”:¹³ that is, people who, for ethical or religious reasons, or simply out of personal preference, disapprove of most modern technology, including computers, mobile phones, the internet, and sometimes ATMs and cars. Examples of contemporary Neo-Luddites include, among religious groups, the Amish, and among secular figures, authors like Chellis Glendinning, Kirkpatrick Sale, and the infamous “Unabomber” Ted Kaczynski (a rather isolated case in his

¹³ Named after the original “Luddites”, a group of English textile workers who protested against the evolution of their working conditions in the early 19th-Century, including the introduction of technological devices that diminished the need for skilled laborers. One tactic they employed involved attacking loom factories and destroying machines (Banning, 2001).

espousal of violent activism). Though Neo-Luddites differ in the specific grounds of their opposition to modern technology, they tend to accuse it of weakening communities, undermining worthy traditions, promoting warfare, destroying the environment, revealing human *hubris* in our pretension to achieve dominion over nature, and encouraging “a mechanistic approach to life” (Glendinning, 1990; see also Sale, 1995). In our technologically-oriented society, in which Neo-Luddites are presumably a minority, there is no doubt that many professional, economic and political opportunities will be closed to them if they act on their dislike of modern technological devices. And while this loss of opportunity still does not, for the most part, translate into coercion in the case of the Amish, who form a largely independent community with – for the most part – no wish to join the broader society, the same cannot be said of secular Neo-Luddites who are part of the dominant culture. Many jobs in that culture thus require both the willingness and ability to use computers, email, and the internet; in a number of cases, the only way to apply for a job is online. Even when no actual requirement to use them is present, rejection of those technologies will still put one at a competitive disadvantage by closing off important sources of information and channels for communication. Public libraries often offer computerized catalogues exclusively. Computers are found in virtually any car manufactured today. And so on. Secular Neo-Luddites thus face both direct and indirect coercion to use devices they would prefer not to use (and which in fact they would prefer to see eliminated). Even their most prominent activists have made concessions to the tech world for the sake of promoting their ideas: the books of Glendinning and Sale can thus be purchased on Amazon. (Some are even available in Kindle format.)¹⁴

Nonetheless, I take it, most of us do not believe that the pressures bearing on all members of our society to adopt those technologies, and the costs to be faced for refusing to do so, are ethically unacceptable, and that new anti-discrimination laws should be passed to protect Neo-Luddites from such costs. Imagine a

¹⁴ In fact, Sale now appears to have resigned himself to the inexorable march of technology and to the coercive pressures that come with it: in a recent interview, he describes attempts to continue the Neo-Luddite battle as “futile” (Hill, 2014).

committed – though perhaps not very pragmatic – Neo-Luddite who wishes to pursue an academic career, which he expects would help his views gain respectability and influence the thinkers of tomorrow, yet is unwilling to make any compromise with regard to his anti-technology convictions. It may well be *nice* if the institutions to which he applied for positions were willing to make special arrangements for him out of respect for his personal beliefs, and allowed him for example to send only hard copies of his application documents, or, assuming he were to be hired, to allow him not to use email (thereby becoming the envy of his colleagues besieged by messages), and to write his academic papers by hand, or on a typewriter, to be then converted into electronic format by another staff member when necessary. Yet it nevertheless does not seem that it would be *wrong* of the university, or discriminatory, to decline to consider this person's application if he refused to comply with their initial expectations – even though the fact that this person could not pursue an academic career due to his rigid personal convictions might still strike us as regrettable, and as something it would be desirable to avoid when possible by allowing such special provisions to be made.

Does our attitude reflect mere prejudice, or can it be supported by argument? There is no doubt that the generalized use of computers, email, mobile phones and other instances of modern technology significantly facilitates communication and coordination within companies and other organizations, which helps further the legitimate goals that such entities pursue, such as greater efficiency and productivity. And in some cases, this can be expected to benefit not only individual organizations, but society as a whole. Greater efficiency in conducting medical research, for instance, means that new life-saving treatments or vaccines will take less time to arrive. The development of medical technology, from MRI machines to clinical decision support systems, has helped improve the ability of physicians to diagnose and treat their patients. Besides their positive impact in the practice of medicine, computers are also yielding precious assistance in other contexts, such as commercial aviation, which is now safer than it has ever been, partly thanks to the role of digital technology in preventing dangerous situations from arising. Computer simulations help us predict the

weather and make breakthroughs in physics, engineering and various other fields. It seems quite plausible to think that these numerous social benefits outweigh the badness of the pressures we are under to use those technologies, even if these pressures mean that some (the Neo-Luddites) must go against their own convictions to conform to them, or face reduced opportunities if they refuse.

It seems to me that a similar argument could be made about indirect coercion to use neuroenhancers. Indeed, neuroenhancement interventions of the sort we have reviewed at the beginning would, *if* they could deliver on their promise, bring many of the same benefits as computers, for instance. By increasing productivity and improving the quality of service of some workers, they would promote the legitimate goals of the organizations that employ them. They would also have broader social benefits. Doctors who, thanks to neuroenhancers, reasoned better at the end of a long shift would be less susceptible to medical errors. Air traffic controllers and truck drivers with better focus and faster reaction times would make road and air travel even safer than they are today, potentially saving many lives. Were neuroenhancement to become the norm among scientists, the pace of research might accelerate, again meaning that crucial breakthroughs (such as new treatments for various diseases) would come sooner.¹⁵ Here again, it seems that the expected social benefits outweigh the badness of the existence of indirect coercion to enhance. Therefore, *ceteris paribus*, our attitude to such coercion should be the same as our attitude to the kind of coercion experienced by Neo-Luddites in the Digital Age.

That said, since this last statement is only true *ceteris paribus*, it does not mean that, as a matter of fact, we have no reason whatsoever to take preventive measures against indirect coercion in relation specifically to neuroenhancement.

¹⁵ As mentioned previously, we should remember that whether or not neuroenhancement will bring such benefits depends to some extent on future advances in machine intelligence. It may be that many of these benefits will in fact be secured by delegating tasks to intelligent machines, rather than through a “neuroenhanced” workforce. However, we have also seen, first, that automation may not affect all professions equally, at least in the near term; in some fields the introduction of neuroenhancement might be more relevant than in others. And secondly, even assuming significant progress in artificial intelligence, neuroenhancement might still help human workers avoid getting left behind by machines in terms of work performance. Any coercive pressures that these technologies might create should therefore be weighed against the fact that they might also contribute to protecting employment opportunities for people!

Indeed, neuroenhancers of the type I am envisaging might still involve normatively relevant differences with the more familiar technological devices we have just discussed. When these differences are present, they will give us additional reasons – distinct from considerations of freedom and autonomy – to ensure that people are protected from indirect coercion to enhance, reasons that can in principle outweigh even the significant benefits to be derived from the general adoption of neuroenhancement. It is to this issue that I turn next.

4. Reasons why coercion to enhance might be objectionable

What considerations could make indirect coercion to use neuroenhancers morally more problematic than coercion to use the technological devices that represent the current “normal”? I will begin by considering one difference that quickly comes to mind: the invasive nature of neuroenhancers, in virtue of which any coercive pressure to use them might be said to violate people’s right to bodily integrity. I will argue that while this consideration does show *compulsion* to enhance, as well as most cases of *direct* coercion, to be ethically objectionable, this does not extend to indirect coercion. I will then look at three other factors which I do take, when present, to render indirect coercion to enhance problematic, and which might misleadingly suggest that such coercion is objectionable in its own right: these factors are lack of safety, fostering adaptation to oppressive circumstances, and having negative side effects that go beyond health.

4.1 *The right to bodily integrity*

Neuro-interventions of the sort described above are arguably more invasive than the use of devices like computers. Both types of intervention, it may be noted, interfere with brain functioning in some way. Even the mere act of using a computer involves having certain sensory experiences (e.g. visual sensations of a computer screen) that form part of our brain activity, and learning, say, how to type on a keyboard produces synaptic connections in our brain that are different from those we would have developed had we only ever relied on pen and paper,

for instance. Nevertheless, computers and similar devices typically affect brain functioning only indirectly, by means of the sensory organs, whereas neuroenhancement interventions do so directly, by introducing a foreign element into a person's body or brain. In the case of psychoactive drugs, a chemical substance is introduced into the person's body and crosses the blood-brain barrier. And even with an intervention like tDCS, which is often described as "non-invasive", an electric current travels through a person's scalp and skull to certain areas of her brain.

Granting the greater invasiveness of neuro-interventions, what are its normative implications? It might plausibly be argued that the right to bodily integrity – that is, the right to resist unwanted interferences with one's own body – represents a fundamental human liberty that ought to be protected by the law. The common acceptance of such a principle presumably explains, for instance, why vaccinations (another invasive procedure) are, in places like North America, not mandatory in most professional contexts. Many hospitals in the US have made flu vaccinations mandatory for healthcare workers (Tuttle, 2015), but a number of them also allow for exemptions, not just for medical reasons but also for religious or philosophical ones. Since the right to bodily integrity does seem a very important one, consistency with our current practices would suggest that at least most employers should not be allowed to directly coerce their employees into using neuroenhancers.

That being said, the same rationale does not seem to apply to indirect coercion. Take again the example of vaccinations. Perhaps it would be wrong of most employers to indirectly coerce their employees into getting vaccinated, e.g. by showing preference for candidates with no objections to vaccination in their hiring practices. But assuming this would indeed be wrong, it is presumably because employees who reject vaccinations present no serious risk of harming the functioning and productivity of the companies they work for (or the health of their colleagues). If so, their employers lack any strong reason to expect them to get vaccinated. However, if a person's objection to vaccinations could in fact be expected to significantly hinder her productivity (and thereby that of the

company), e.g. by causing her to take extended periods of sick leave, *and* if that person did not have valid reasons for her view¹⁶ (but held it, for example, on the basis of mistaken empirical beliefs), then it would no longer seem problematic for an employer to be less willing to hire people holding such a view. In line with what I have said in part 3, I would treat analogous cases involving indirect coercion to enhance in the same manner.

What is more, even in the case of vaccinations, not all hospitals incorporate exemptions for healthcare workers. In some cases, workers have been fired for refusing vaccination on non-medical grounds (Tuttle, 2015). The reasoning of the employers in such cases is that such workers present a threat to those around them, particularly patients with already fragile health. In the case of neuroenhancers, we have seen that in some professions, they might be expected to save lives, e.g. by reducing the number of medical errors among doctors. When the stakes are so high, it is no longer clear that people's right to bodily integrity should always trump the need to prevent serious harm to people to the greatest possible extent. It might therefore conceivably be appropriate, under certain conditions and in certain professional contexts, to tolerate even direct coercion (though not compulsion) to enhance – even though such cases will presumably be the exception rather than the rule, as most professions do not involve stakes of that magnitude. The interest of a company in maximizing the productivity of its employees for the sake of profit clearly does not carry the same ethical weight as society's interest in avoiding preventable deaths in contexts like medicine or air travel.

For those who, at this point, might still have the intuition that even indirect coercion to use neuroenhancers is ethically problematic because it threatens bodily integrity, I now want to suggest that it might be possible to explain that intuition by appeal to a distinct consideration – namely the implicit assumption that such invasive interventions present a serious risk for users.

¹⁶ Valid reasons could for instance be medical ones (intolerance to some vaccines). I will consider such reasons in relation to neuroenhancement in the next section.

4.2 Safety

Arguably, it is problematic when a person is coerced, even in an indirect manner, into using interventions that pose significant risks to her health. Very weighty considerations will be needed to justify such a practice, and it isn't clear that the expected benefits of neuroenhancement just listed will be weighty enough. The chronic use of psychostimulants like Adderall is thus known to have a variety of side effects, from milder ones like dry mouth and insomnia to potentially serious conditions including addiction, psychosis, cardiovascular problems, and even sudden death (Lakhan & Kirchgessner 2012). It would seem wrong to pressure doctors or air traffic controllers to compromise their health by taking such substances, even if this could be expected to yield significant social benefits. Similarly, if it were to turn out that Ritalin and Adderall use really had become necessary for many students to keep up with their peers in terms of academic performance (and was not merely perceived as such), this might provide a justification for an outright ban on the non-therapeutic use of those substances by students, to be enforced by drug tests if necessary. While such a system would certainly be coercive towards those who wished to use those stimulants despite the risks involved, it would be similar in spirit to, say, the widespread practice of banning smoking in public places, in order to forestall harm from passive smoking. True, we have seen that, already today, US pilots can be pressured to use substances like amphetamines or modafinil to complete long flight missions. But first, taking such drugs is to some extent in the pilots' own interest, insofar as it reduces their risk of having a crash due to fatigue;¹⁷ and secondly, one might argue that matters of national defense are weightier than even the sort of considerations I have adduced in favour of neuroenhancement in other contexts.

Importantly, however, our safety-based reason to protect people from coercion to enhance will only hold for interventions which, in light of our current knowledge, do not appear safe enough. While this likely applies to substances like amphetamine, the status of other drugs like modafinil, or of interventions

¹⁷ A similar argument would apply in the case of long-haul truck drivers, yet in their case there seems to be more room for adjusting work conditions so as to remove the need for stimulant use.

like tDCS, is less clear. Modafinil has so far appeared to have a significantly better safety profile than amphetamine, though controlled studies of its long-term effects on healthy users are still lacking (Porsdam Mann and Sahakian, 2015). The safety of tDCS has already been demonstrated in controlled laboratory settings, but not yet in the “real” world (Dubljevic et al., 2014). It might be argued on that basis that no one should be pressured to become a guinea pig by undergoing interventions the long-term safety of which is still in doubt. Notice, however, that we seem willing to tolerate pressures of just that kind in relation to some familiar technological devices: the health effects of long term mobile phone use are thus still not known with certainty, and in 2011 mobile phone radiation was classified as “possibly carcinogenic” by the International Agency for Research on Cancer (WHO/IARC, 2011; see also Maron, 2016). Yet very few of us are protesting at the fact that avoiding exposure to cell phone radiation is virtually impossible in our society. This still doesn’t mean that coercion to use modafinil or tDCS is necessarily acceptable – for instance, modafinil has a number of side effects that are absent from mobile phones, and as we have seen, some researchers are concerned about its addictive potential (Volkow et al., 2009; Heinz et al., 2012). The line at which an intervention can be considered “safe enough” is a tricky one to draw, but wherever we choose to draw it, it is important not to set more stringent standards for neuroenhancers simply because they are recent and unfamiliar, or because some of them bear the bad name of “drugs”.

So far I have been considering scenarios in which neuroenhancement posed a health risk for all or at least most people. However, we could also imagine a case in which the relevant interventions were only dangerous for a minority of people with a specific bodily constitution. The members of that unlucky minority would then find themselves pressured to take risks that most people in their society did not have to face, in order to remain competitive on the job market (and perhaps other contexts too). Would a ban on most neuroenhancement technologies be justified in that type of case as well? In light of the expected benefits of a wide adoption of neuroenhancement, adopting such a ban would seem difficult to defend, and would be at odds with our existing practices. Consider for instance

that people with certain disabling conditions (e.g. osteogenesis imperfecta, which causes brittle bones that are prone to fracture) may face a heightened risk of injury at their workplace or while commuting. As a result, it may be safer for these people to work from home. Many employers, however, may prefer their employees to be present at the workplace, creating pressures on members of the group with disabilities to face the associated risks. Still, our society does not try to counteract these pressures by forcing everyone to work at home, and neither does it forbid employers to expect non-disabled employees to travel to the workplace. Rather, people with disabilities are protected from such pressures from prospective employers in two ways. The first one is disability benefits, for those who have difficulty finding adequate employment and have limited resources to live on. Secondly, civil rights laws like the American With Disabilities Act require employers, in certain cases, to provide “reasonable accommodations” for people with disabilities. This could involve allowing an employee to work from home, to come back to the example previously described. That said, employers are only subject to such a requirement provided that the accommodation will allow the employee to perform all the essential functions of the job, and that it will not create an “undue hardship” for the employer (Zackin et al., 2015).

If an unlucky minority were to emerge for whom neuroenhancement technologies presented a health risk, its members should be granted some of the same legal protections as those that people with disabilities enjoy today. Which protections exactly? Given that the job performance of workers who did not use neuroenhancers would usually be inferior to that enhanced workers (that is, after all, one of the core purposes of neuroenhancement),¹⁸ it might be difficult to make a persuasive case for requiring employers to show no preference for enhanced workers in their hiring practices. Offering a form of compensation akin to disability benefits to those who suffered from their inability to enhance themselves might be a more defensible proposal. Nonetheless, this issue is a

¹⁸ Of course, this might not always be true, as it would partly depend on the magnitude of the enhancement, as well as on each person’s “natural” level of performance. E.g. a person of average intelligence who was able to boost her IQ to 130 thanks to neuroenhancement would still not match “natural” geniuses.

complex one where the right conclusion might depend on a number of factors, including the magnitude of the health risks encountered by the unlucky minority, and the opportunity costs that would be entailed by measures destined to secure equal employment prospects for the members of that minority. Depending on the details of the situation, we might decide that adopting such measures would in fact be appropriate.

I would maintain, however, that there would be no adequate grounds for extending such compensatory or protective measures to people who abstained from neuroenhancement purely out of personal preference or on the basis of philosophical or religious beliefs hostile to technology, if they faced no health risks from the relevant procedures – just as people who might demand to work from home for similar, non-medical reasons would not be entitled to any special compensation for, or protection against, the associated loss in their professional opportunities.

4.3 Fostering adaptation to oppressive circumstances and corrupting a person's affective life

By oppressive circumstances, I mean circumstances in which a person's significant interests, potentially grounding corresponding *rights*, are being disregarded, with the result that the person is deprived of a significant component of a good human life. The interests in question can be varied. Consider someone who has just experienced the loss of a close relative. Even though there is no federal law in the United States requiring employers to grant "bereavement leave" to employees who find themselves in such a situation, many companies do have policies granting a number of days off work (usually around three) to bereaved employees, for the purpose of allowing them to attend funeral services but also to mourn their loss. (In some countries like Canada, this practice is actually legislated in most jurisdictions.) Suppose now that, due to the advent of a safe and effective mood and/or motivation enhancer, companies with a bereavement leave policy decided to shorten or even terminate it, on the grounds that it was no longer necessary for their employees to experience the

feelings of dejection that normally accompany bereavement – and that tend to cost the company money by temporarily diminishing productivity. It would arguably be wrong of companies to deprive their employees of bereavement leave in this way (or even to be more willing to hire candidates who freely agreed to forfeit it), as, first, this would go against the employees’ significant interest in expressing their love for the departed through mourning, and secondly, it would pressure them to corrupt their affective lives by preventing themselves from experiencing fundamental human emotions that were appropriate to the situation they were in.¹⁹

Other examples could be given. Suppose for instance that the customer service advisors of a company came under pressure to use a new personality enhancer that would (safely) give them an unshakeably agreeable disposition, one they would retain even when dealing with the rudest of customers, because their managers expected this to maximize customer satisfaction.²⁰ Here too, one might argue that such pressure from their employer was wrong because it required them to adjust to oppressive circumstances: circumstances in which their interest in defending themselves (with due politeness) against insults, thereby preserving their self-respect, would be frustrated. Furthermore, it would again have a corruptive influence on their character by making them overly docile. While agreeableness probably does constitute a reasonable requirement of positions of this kind, it does not follow that a customer service advisor should *always*, even when confronted with aggressive, racist, or otherwise disrespectful people, behave agreeably if she is to do her job well.

¹⁹ Admittedly, this second charge would especially apply if the relevant mood enhancer were to constantly affect the emotional state of bereaved employees as long as they kept taking it. It would have less force in a scenario where the effects of the enhancer were short-lived and dissipated once the working day was over (provided that one stopped using it until the next morning). In the second scenario, unlike the first, the bereaved person could still experience the “right” emotions outside of the work context. The employee’s high mood level at work might still be troubling, and coercion to artificially induce it would still seem problematic, but the concern would be less pronounced.

²⁰ From the perspective of the managers, the intervention would thus count as a personality enhancer, even though we may not regard it that way.

Admittedly, it is less clear that such a line of argument could be extended to employers who required their employees, whether directly or indirectly, to display the maximum degree of agreeableness, extraversion, or sunniness still lying within the “healthy” range of those traits (so that they didn’t collapse into obsequiousness or gullibility), either with a view to promoting customer satisfaction, or in order to satisfy their own individual preferences for certain personality traits. Indeed, talk of corrupting the users’ affective dispositions would no longer seem appropriate in such cases. And it does seem appropriate to grant employers a certain leeway (though not an unlimited one) with respect to the personal qualities of applicants that they can base their hiring decisions on. There are at least two types of situation in which it could be legitimate for an employer to allow a candidate’s personality to affect her hiring decision: first, if the candidate’s personality could be expected to affect her future job performance, as well as that of the company as a whole. And secondly, if her personality were likely to affect the atmosphere in the workplace. For instance, a very unpleasant person who did not get along with any of her colleagues could compromise the performance of her working group, even if individually she were very efficient. And even if she had no negative impact on anyone’s performance, because others had learnt how to put up with her bad attitude, she might still negatively affect everyone’s mood at the office. If an employer had good reason to foresee any of these consequences, it seems that she would be entitled to decline to hire this person on account of her disagreeable personality.

Finally, suppose that some white-collar workers at a company started using a safe pharmaceutical that significantly boosted their motivation to work and safely reduced their need for sleep to 4 hours a night, thereby enhancing their productivity. Thanks to the intervention, they find it easy to tolerate a 120-hour workweek, partly because they now need less sleep, and partly because they have a diminished interest in non-work related activities, including social interactions with friends and family (to mirror an effect of Adderall described by Vrecko, 2013, p. 9). Their personal life becomes impoverished as a result of this workaholic lifestyle, but since their foremost priority is career advancement, they are willing to pay the price. Their superior productivity soon earns them the

favours of the management in the form of promotions and bonuses, inciting other workers to adopt the enhancement too. Soon, enough people at the company are working 100 hours or more a week with the help of neuroenhancers to put pressure on the rest of the employees to follow suit, on pain of being viewed as setting everyone back and eventually losing their job. Slowly, the 100-hour+ workweek creeps into social expectations and becomes the “new normal”. Most of us, I assume, would regard this as a nightmarish social development: as society having adapted to, and promoting, an oppressive workaholic mindset.²¹ While we may very much welcome an enhancer that safely reduced our need for sleep, we would presumably still object to it if it also impacted our motivational set and lifestyle in this manner.

All of these examples involve the corruption of an employee’s affective life, as well as an adaptation to oppressive circumstances in which a significant interest shared by all people gets frustrated, even though a different interest is being disregarded in each case. In the first (bereavement) case, this interest is the chance to mourn the loss of a loved one; in the second (customer service) case, it is the ability to act so as to protect one’s self-respect; and in the third (workaholic) case, it is the enjoyment of an adequate work-life balance.²² Perhaps we could take one step further and add that a corresponding right is also being violated in each scenario: that is, respectively, the right to mourn, to self-respect, and to an adequate work-life balance. The last of these putative rights, however, might elicit the objection that in contexts like the American one, it is agreed that some people, such as Wall Street bankers, can legitimately be expected by their employer to work 80 to 100 hours a week on a regular basis.

²¹ One might object that this scenario is implausible, because most people would object to such a social development, including many employers who desire work-life balance for themselves, which would prevent that state of affairs from ever becoming the norm. While I very much hope that this is correct, and that the course of action recommended by Vincent and Jane with regards to cognitive enhancement would be followed in relation to the workaholic pill, it nevertheless seems at least conceivable that the scenario I have described could occur: for instance, those at the top of the ladder might either regard minimal amounts of free time as adequate, or they might secure better conditions for themselves than for their employees, who in turn might feel they had no choice but to accept such an extreme work schedule (and might simply get progressively used to it).

²² In addition to these, there is presumably another interest (or even right) being disregarded in all scenarios: namely the interest in not being pressured to corrupt one’s own affective life or character.

Unlike most European countries, the United States does not have regulations stipulating a maximum number of working hours per week (Kaufman, 2013).²³ However, even recognizing such a practice as legitimate need not conflict with the view that everyone, including Wall Street bankers, has a right to work-life balance – one would then just have to add that people can permissibly waive that right, if they wish for instance to trade it for an extremely lucrative career.

At the regulatory level, I would argue that if a scenario like the workaholic pill were ever to become reality, maximum working hours, of the kind set out in the Working Time Directive (2003/88/EC)²⁴ of the European Union (which sets the limit at 48 hours per week on average, though we could debate whether this amount is adequate or not) should be used as a tool to protect people from unconditional coercion to use such a neuroenhancer. However, I leave it open whether exceptions to that regulation should be allowed for certain occupations (as is the case in countries like the United Kingdom). Perhaps conditional coercion to take the workaholic pill could be tolerated, as long as we could be confident that it would remain confined to just a few specific domains and would not spread to the rest of society. If the risk of it spreading were sufficiently real, however, it would give us a reason not to allow any exceptions at all to maximum working hours.²⁵

Similarly, when it comes to the bereavement and the customer service scenarios, I would support laws prohibiting employers from directly or indirectly coercing their employees into using the relevant neuroenhancers, in the spirit of existing laws meant to protect people with disabilities from discrimination. However, I would be less inclined to consider the possibility of exempting certain employers

²³ While some jobs do require employers to pay their employees more if they make them work beyond a certain number of hours per week (so-called “overtime”), there is no upper limit on overtime hours in the US (Lee et al., 2007).

²⁴ Available online at <http://eur-lex.europa.eu/legal-content/EN/ALL/?uri=CELEX:32003L0088> [accessed 29/6/2016].

²⁵ Let me emphasize that this conclusion applies to the example of the workaholic pill as I have specifically characterized it. A few tweaks in the example might elicit quite different intuitions. For instance, in the case of a pill that safely cut our need for sleep by half, but had no impact on our motivational set, we might not necessarily object if part of the waking time thus gained were devoted to working a few more hours per week.

or professions from such regulations than in the case of working time, because the human goods that would then be sacrificed are arguably of even greater ethical importance than work-life balance is. While sacrifices of work-life balance are viewed as undesirable yet are commonly tolerated provided that they are only temporary, someone who sacrificed their self-respect, even temporarily, would usually be considered as having suffered a serious ill, not just an inconvenience.

4.4 *Negative side effects that go beyond health*

Even if the coercion to enhance did not foster adaptation to oppressive circumstances, it could still have serious negative side effects, impacting not the person's health but rather her well-being or interests.²⁶ These side effects could mean that the person now had maladaptive emotional and behavioral dispositions, but they could also simply consist in a large amount of unnecessary psychological suffering. Consider again the example of workers seeking to increase their productivity. Rather than resorting to a workaholic pill, they might use a neuroenhancer that gave them laser-like focus and cleared their thinking, allowing them to get more done within a given amount of time and with no loss of quality. Suppose, however, that the effects of the intervention do not dissipate as soon as the working day is over, but persist until late into the night, as a result of which users strike those around them as being constantly hyper-focused, lacking in spontaneity, and incapable of relaxing. Their social and personal life would therefore suffer, even though the length of their work week might not be excessive (unlike the workaholics, they don't work longer hours, just more effectively) and their general work conditions, not oppressive.²⁷

²⁶ Which by the definition given in section 4.3, would mean ultimately creating oppressive circumstances for the person – but this time would not foster *adaptation* to such circumstances.

²⁷ This contrast is sometimes overlooked. My impression is that the common worry that neuroenhancement will unavoidably promote oppressive imperatives of performance and productivity only derives plausibility from the fact that, usually, these imperatives demand sacrificing our work-life balance, or health (or both). But in principle, neuroenhancement need not demand sacrificing either: e.g. it might simply make us more effective and productive by making us smarter. There is nothing intrinsically oppressive about demanding that people use more rather than less effective tools to improve their job performance, provided that the use of these tools is safe enough.

Other, similar examples could be offered: for instance, one could imagine employees (say, waiters in busy establishments) being pressured to use memory enhancers to perform better at work, and then becoming tormented by unwanted, unpleasant memories they otherwise wouldn't have retained (Erler, 2011). Again, if the use of such interventions were to spread because of the competitive advantage they conferred at work, thereby putting pressure on people to use them and suffer the consequences, we would have a problematic scenario that might require imposing disincentives, or even a complete ban if necessary, on the use of the relevant interventions, to protect people from coercion to use them. The general thing to note about scenarios of this kind is that this particular reason to object to such coercive pressures would disappear if the interventions in question could be fine-tuned to the point where they no longer had such negative side effects. For instance, it might be possible to ensure that the effects of some neuro-intervention didn't last longer than the period of time during which they were desired (i.e. working hours), either by using an intervention that only had short-term effects and adjusting one's intake accordingly, or by using another intervention to cancel out the effects of the first when needed.²⁸

There are, therefore, a variety of reasons why indirect coercion to enhance might prove objectionable, including, to recapitulate, the fact that it might pose a threat to the health of users; that it might foster adaptation to oppressive circumstances; and finally, that it might have harmful side effects other than health effects. Nevertheless, these reasons are distinct from the intrinsic badness of coercion itself. This means that, if an effective neuroenhancer turned out to be available that avoided these various ethical pitfalls (and any other I may have omitted), there would be no good grounds for regarding coercion to use that intervention as ethically problematic. Or at least, such coercion would be no

²⁸ No doubt, such a process may not be without its own complications. Counteracting the potential undesirable side effects of memory enhancement by blunting or erasing memories, for instance, would raise a number of issues: is there a risk that people might go too far in re-writing their own memories? How far is "too far"? And even if one only wished to mimic "normal", healthy forgetfulness, how would one even know what that concretely meant?

more problematic than the one we already tolerate in relation to the technological devices to which Neo-Luddites are hostile.

5. Possible objections

I will conclude by considering potential objections that might be leveled at the analysis I have offered. As I cannot pretend to be exhaustive, I will limit myself to three that come readily to mind.

5.1 *Cognitive liberty*

First, it might be argued that the position I have defended neglects people's right to cognitive liberty – which has been characterized as “a right to (and not to) direct, modify, or enhance one's thought processes” (Sententia, 2013, p.356; see also Bublitz, 2013). Such an important right, it might be said, would be threatened by coercive pressures – even of the indirect kind – to use neuroenhancers, whereas that is not the case with the pressures to use computers and other similar technological devices that we already tolerate. Indeed, the argument would go, while neuroenhancers clearly involve the modification and enhancement of our thought processes (that is, after all, their very purpose!), one might find it less clear that tools like computers do so as well. After all, unless we accept the somewhat controversial thesis of the extended mind, we may doubt that the use of computers or smart phones improves, say, our concentration or memory (in fact, we may fear that it impairs those capacities!), no matter how useful these devices might be in other ways. If there were indeed such a difference between neuroenhancers and more traditional technological devices, they would call into question my claim that indirect coercion to use the former should be regarded as ethically on a par with similar coercion to use the latter (which as we have seen is not usually considered problematic).

For the most part, however, this objection does not stand up to scrutiny. (I will add two caveats in a moment.) Working on a computer for many hours, by impacting our sensory experience, certainly modifies our thought processes (compared to what they would be if we were using different tools to do our work). Furthermore, computers that provide us with information we couldn't have obtained otherwise (such as those that allow us to run weather forecast models), or help us make complex decisions (such as clinical decision support systems), arguably enhance our thought processes or at least our ability to make decisions (e.g. whether to go for an evening walk, or to stay home because the weather is likely to turn inclement). Even if it became difficult and penalizing – as it already is to some extent – to avoid relying on those devices for the purpose of weather forecasting, making a medical diagnosis, and in other contexts, should we object to that state of affairs on the grounds that it constituted an illegitimate infringement on our cognitive liberty?²⁹ If not, then that notion does not justify objecting, either, to a “new normal” that involved neuroenhancers.

That being said, it should be acknowledged, first, that this objection may have greater plausibility when applied to *compulsion* to enhance. Physically forcing someone, against their will, to use a computer, or to watch a certain movie, would typically be wrong, and this might partly be explained by the fact that it would involve an interference with their thought processes to which they had not consented (not even implicitly) and were, on the contrary, opposed. In cases of indirect coercion, however, interventions are not imposed on users without their consent (even though they may resent the pressures that they face to use those interventions).

Secondly, there is one particular type of indirect coercion to enhance that would indeed raise legitimate concerns about potential infringements of cognitive liberty: namely, coercion to use neural implants that would be vulnerable to hacking. This would especially apply to implants that got connected – at least occasionally – to the internet, in order for instance to vastly expand the amount

²⁹ There are various other ways in which people are expected to modify their minds for professional purposes: think of employee training programs, for instance.

of information directly accessible to a person's mind, or to enable "telepathic" communication between the brains of two different people, who could be located in opposite parts of the planet. Hackers could conceivably break into such a system and gain access, say, to a person's private memories stored in digital form. Worse, they might even be able to tinker with those memories, or with some of the person's thought processes, and ultimately influence the person's behavior by taking control of her implant (a process that has been dubbed "brainjacking"; see Pycroft et al., 2016). Such actions would constitute serious violations of privacy and cognitive liberty, and there would be solid grounds for working to prevent even indirect coercion to use interventions that put one at a non-trivial risk of suffering such harms. Presumably, this concern only applies to a subset of neural implants, provided that it is possible to create hacker-proof implants (if only by confining them to offline use), yet it is an important one to bear in mind nonetheless.

5.2 Isn't there something to the Neo-Luddites' arguments?

A second possible objection would be that I have been too quick to assume that there is nothing problematic about the sort of pressures we already tolerate in relation to technology use. Isn't there more to the Neo-Luddites' arguments than I have been willing to recognize? After all, the global increase in computer use has brought a number of health issues, such as visual and musculoskeletal problems. I have already mentioned the uncertainty surrounding the impact of long term mobile phone use on health. Used laptops, mobile phones, digital cameras and other electronic devices are being dumped by the millions into developing countries, where they are dismantled in often unsafe conditions, leading to environmental damage and harmful effects on the health of local populations. As a result of the ubiquity of mobile phones, many employees are now expected to be reachable on an almost constant basis, allowing working time to seep into their private lives and elevating their stress levels. Finally, there is evidence that the use of computers and cell phones, while allowing people's social networks to spread out through geographic space, has simultaneously led to a reduction in the probability of face-to-face encounters

with family and friends, and promotes a wider array of weak social ties rather than more localized yet stronger ties (e.g. McPherson et al., 2006), which some might interpret as vindicating the Neo-Luddites' concern about the weakening of community ties due to the spread of technology.

While these may all be valid concerns, two things should be noted here. First, it isn't clear that recognizing their force implies that we should accept the validity of the Neo-Luddite position on modern technology. For one thing, the Neo-Luddites fail to acknowledge the many benefits it brings, and which need to be weighed against its drawbacks; for another thing, it may be possible to address these drawbacks otherwise than through the radical solution of turning away from such technology. The musculoskeletal disorders experienced by many computer users can be prevented by, for instance, maintaining good posture and taking frequent breaks. The harmful effects of electronic waste could be dealt with by promoting recycling, as well as inciting manufacturers to design devices in a more environmentally-friendly way (so they can be repaired and recycled wherever possible) and discouraging planned obsolescence.³⁰ As for the negative social effects of computer and cell phone use, they can be mitigated by working to change our attitudes and behavior: e.g. by deliberately limiting our use of those devices (especially outside of work) to make time for real-life interactions, and by negotiating with employers so that expectations about being reachable remain as much as possible confined within certain limits and do not extend, for instance, into vacation time.

But more importantly, even if we assume that there is in fact more to the Neo-Luddite view than I have been willing to acknowledge, this still wouldn't contradict the central claim I have defended: namely that the sheer existence of coercion to use modern technology is not in itself bad enough to warrant taking measures to counteract it, whether in relation to technological devices like

³⁰ By its very nature, of course, technological progress makes the phenomenon of obsolescence unavoidable, and we may well be seeing it evolve at a faster rate today than it ever has previously. Still, this should not be equated with the notion of *planned* obsolescence, which involves deliberate efforts to shorten a product's lifespan so as to force consumers to buy a replacement sooner (even though the replacement product need not improve in any way upon its predecessor).

computers or to neuroenhancers. While adopting the Neo-Luddite proposal would admittedly eliminate coercion to use such technology, it nevertheless wouldn't do so *for the sheer sake* of eliminating it, but rather on the basis of distinct considerations, such as those just listed (health, social harms, and environmental damage). Set aside those considerations, and technology use again appears overall desirable in light of the expected benefits, even if it leads to some degree of coercion.

5.3 *Wouldn't the "new normal" create oppressive circumstances?*

This reply can help us answer a third and final objection, which would ask what prevents Neo-Luddites themselves from arguing that they have a significant interest in staying away from computers and also, presumably, from neuroenhancers. After all, whatever one thinks of their beliefs about technology, they surely have a strong interest in being able to live in accordance with them. Such an ability does seem to represent an important component of a good human life. On my own account, then, can't the Neo-Luddites complain of being forced to adjust to oppressive circumstances? And won't the same be true of all the opponents to neuroenhancement, if it ever becomes the new normal?

Two things should be said in response. First, it is not clear that Neo-Luddites are completely unable to live in accordance with their personal beliefs, even amid the ubiquity of modern technology in contemporary society. Indeed, they can still avoid using such technology whenever possible, and express their condemnation of it in oral or written form, as authors like Sale and Glendinning have been doing. Admittedly, there is a significant cost to such avoidance, and sometimes avoidance is simply not an option, in which case compromises are required. But this is still not the same as having no leeway to follow one's Neo-Luddite beliefs. Similar remarks would apply to those who opposed neuroenhancement in a world in which it had become the "new normal".

It might be objected here that the compromises that people with such convictions would have to make would be very significant indeed, and that this

would largely deprive them of the good of being able to follow these convictions. This leads me to my second point: the extent to which such people can be said to be facing oppressive circumstances and to be deprived of an important human good partly arguably depends on the plausibility of the beliefs that they want to follow. And I would claim that, because those beliefs are not supported by truly persuasive arguments in the case of the Neo-Luddites and of those who oppose neuroenhancement under any form, the good that these people might miss out on by living in a society where such interventions have become the norm is not of the same magnitude as the sacrifice of one's self-respect or the long-term loss of work-life balance. As a result, their circumstances are not plausibly characterized as oppressive, even though they may experience them as such. Being unable to fully live out one's personal philosophy is not necessarily enough, absent any constraints on the content of that philosophy, to count as finding oneself in oppressive circumstances. People whose personal philosophy or religion tells them that friendships are vicious, or that civilization is evil, arguably do not count as living in oppressive circumstances if they find themselves unable to avoid all friendships or all contact with the fruits of modern civilization – even though society should avoid hindering their pursuit of their own conception of the good, provided that this does not entail unacceptable social costs.³¹

6. Conclusion

If the central argument I have presented here is correct, the prospect of neuroenhancement becoming the “new normal” is not, in itself, a proper source of ethical concern, insofar as the coercive pressures it would create would be of the indirect type (as opposed to compulsion and most cases of direct coercion, which are indeed problematic in themselves and should be forestalled by

³¹ And if we suppose, again, that the Neo-Luddite position is in fact more plausible than I incline to believe, it might then become appropriate to say that Neo-Luddites are currently facing oppressive circumstances. But this would not simply be because they are unable to fully live in accordance with their personal philosophy: rather, it would be because they are (by hypothesis) suffering the harms from technology that that philosophy has identified.

appropriate regulation). Nevertheless, there are various distinct factors that could make the advent of this “new normal” problematic. I have tried to spell out what these factors might be.

The question then becomes: once we acknowledge the relevance of those factors, will we end up agreeing, when it comes to regulating neuroenhancement, with those who believe that coercion to enhance should be opposed as such? The answer will depend on whether neuroenhancers already exist, or at least can reasonably be anticipated in the near future, that are both effective, safe, and can be widely used without leading to the ethical pitfalls I have described. Further empirical evidence will be needed to establish this. At any rate, given the contingent nature of the link between these pitfalls and neuroenhancement use, it is important to be clear about what our justification is if we do decide that safeguards against indirect coercion are needed, so that we can identify what sort of future, improved interventions might in principle render that justification obsolete. Whether or not such safeguards are appropriate, however, it remains desirable for society to promote, within the limits of practicality, a spirit of tolerance for dissenters from technology that would mitigate the costs they will unavoidably have to bear as a consequence of their personal beliefs.

Word count: 13,209 w. (including footnotes, excluding references)

REFERENCES:

- ANDRZEJEWSKI, S. A. & MOONEY, E. C. 2016. Service with a Smile: Does the Type of Smile Matter? *Journal of Retailing and Consumer Services*, 29, 135-41.
- APPEL, J. M. 2008. When the Boss Turns Pusher: A Proposal for Employee Protections in the Age of Cosmetic Neurology. *Journal of Medical Ethics*, 34 (8), 616-8.
- BANNING, D. 2001. Modern Day Luddites. *Media Technologies and Society* [Online]. Available: <http://www.jour.unr.edu/j705/RP.BANNING.LUDDITE.HTML> [Accessed 11/6/2016].
- BUBLITZ, J. C. 2013. My Mind Is Mine!? Cognitive Liberty as a Legal Concept. In: HILDT, E. & FRANKE, A. G. (eds.) *Cognitive Enhancement: An Interdisciplinary Perspective*. Dordrecht ; New York: Springer, 233-64.
- CAPLAN, A. 2003. Is Better Best? *Scientific American*, 289, 104-5.

- CHATTERJEE, A. 2006. The Promise and Predicament of Cosmetic Neurology. *Journal of Medical Ethics*, 32, 110-3.
- COFFMAN, B. A., CLARK, V. P. & PARASURAMAN, R. 2014. Battery Powered Thought: Enhancement of Attention, Learning, and Memory in Healthy Adults Using Transcranial Direct Current Stimulation. *Neuroimage*, 85 Pt 3, 895-908.
- COHEN KADOSH, R., LEVY, N., O'SHEA, J., SHEA, N. & SAVULESCU, J. 2012. The Neuroethics of Non-invasive Brain Stimulation. *Current Biology*, 22 (4), R108-11.
- DOUGLAS, T. 2008. Moral Enhancement. *Journal of Applied Philosophy*, 25, 228-245.
- DOUGLAS, T. 2013. Moral Enhancement via Direct Emotion Modulation: a Reply to John Harris. *Bioethics*, 27, 160-8.
- DUBLJEVIC, V. 2013. Cognitive Enhancement, Rational Choice and Justification. *Neuroethics*, 6, 179-87.
- DUBLJEVIC, V., SAIGLE, V. & RACINE, E. 2014. The Rising Tide of tDCS in the Media and Academic Literature. *Neuron*, 82 (4), 731-6.
- DUKE UNIVERSITY 2011. Student Conduct: Academic Dishonesty. In: UNIVERSITY, D. (ed.).
- ERLER, A. 2011. Does Memory Modification Threaten Our Authenticity? *Neuroethics*, 4 (3), 235-49.
- FARAH, M. J. 2002. Emerging Ethical Issues in Neuroscience. *Nature Neuroscience*, 5, 1123-9.
- FARAH, M. J. 2012. Neuroethics: the Ethical, Legal, and Societal Impact of Neuroscience. *Annu Rev Psychol*, 63, 571-91.
- FOCQUAERT, F. & SCHERMER, M. 2015. Moral Enhancement: Do Means Matter Morally? *Neuroethics*, 8, 139-51.
- FORLINI, C. & RACINE, E. 2009. Autonomy and Coercion in Academic "Cognitive Enhancement" Using Methylphenidate: Perspectives of Key Stakeholders. *Neuroethics*, 2.
- GIROTTO, E., MESAS, A. E., DE ANDRADE, S. M. & BIROLIM, M. M. 2014. Psychoactive Substance Use by Truck Drivers: a Systematic Review. *Occup Environ Med*, 71, 71-6.
- GLENDINNING, C. 1990. Notes Toward a Neo-Luddite Manifesto. *Utne Reader*, 38, 50-3.
- GREELY, H., SAHAKIAN, B., HARRIS, J., KESSLER, R. C., GAZZANIGA, M., CAMPBELL, P. & FARAH, M. J. 2008. Towards Responsible Use of Cognitive-Enhancing Drugs by the Healthy. *Nature*, 456, 702-5.
- HALL, W. 2004. Feeling 'Better Than Well'. *EMBO Reports*, 5, 1105-9.
- HARRIS, J. 2011. Moral Enhancement and Freedom. *Bioethics*, 25, 102-11.
- HEINZ, A., KIPKE, R., HEIMANN, H. & WIESING, U. 2012. Cognitive Neuroenhancement: False Assumptions in the Ethical Debate. *J Med Ethics*, 38 (6), 372-5.
- HIGGINS, D. M., PETERSON, J. B., PIHL, R. O. & LEE, A. G. 2007. Prefrontal Cognitive Ability, Intelligence, Big Five Personality, and the Prediction of Advanced Academic and Workplace Performance. *J Pers Soc Psychol*, 93, 298-319.
- HILL, K. 2014. The Violent Opt-out: The Neo-Luddites Attacking Drones And Google Glass. *Forbes* [Online]. Available:

- <http://www.forbes.com/sites/kashmirhill/2014/07/15/the-violent-opt-out-people-destroying-drones-and-google-glass/> - 35d3c3913bb7 [Accessed 11/6/2016].
- ILIEVA, I. P. & FARAH, M. J. 2013. Enhancement Stimulants: Perceived Motivational and Cognitive Advantages. *Frontiers in Neuroscience*, 7, 198.
- KAUFMAN, G. 2013. *Superdads : How Fathers Balance Work and Family in the 21st Century*, New York and London, New York University Press.
- KRAMER, P. D. 1993. *Listening to Prozac*, New York, N.Y., U.S.A., Viking.
- KURZWEIL, R. 2005. *The Singularity Is Near : When Humans Transcend Biology*, New York, Viking.
- LAKHAN, S. E. & KIRCHGESSNER, A. 2012. Prescription Stimulants in Individuals With and Without Attention Deficit Hyperactivity Disorder: Misuse, Cognitive Impact, and Adverse Effects. *Brain and Behavior*, 2 (5), 661-77.
- MARON, D. F. 2016. Major Cell Phone Radiation Study Reignites Cancer Questions. *Scientific American* [Online]. Available: <http://www.scientificamerican.com/article/major-cell-phone-radiation-study-reignites-cancer-questions/> [Accessed 19/6/2016].
- MCPHERSON, M., SMITH-LOVIN, L. & BRASHEARS, M. E. 2006. Social Isolation in America: Changes in Core Discussion Networks over Two Decades. *American Sociological Review*, 71 (3), 353-75.
- MEHLMAN, M. J. 2004. Cognition-Enhancing Drugs. *Milbank Quarterly*, 82, 483-506.
- MEHLMAN, M. J. 2015. Captain America and Iron Man: Biological, Genetic and Psychological Enhancement and the Warrior Ethos. In: LUCAS, G. (ed.) *Routledge Handbook of Military Ethics*. London; New York: Routledge, 406-20.
- MEINZER, M., JAHNIGEN, S., COPLAND, D. A., DARKOW, R., GRITTNER, U., AVIRAME, K., RODRIGUEZ, A. D., LINDENBERG, R. & FLOEL, A. 2014. Transcranial Direct Current Stimulation over Multiple Days Improves Learning and Maintenance of a Novel Vocabulary. *Cortex*, 50, 137-47.
- MEOLA, A. 2016. Self-Driving Trucks Will Hit the Road More Quickly Than Cars. *Business Insider* [Online]. Available: <http://www.businessinsider.com/self-driving-trucks-will-hit-the-road-more-quickly-than-cars-2016-4?IR=T> [Accessed 28/5/2016].
- PARTRIDGE, B., BELL, S., LUCKE, J. & HALL, W. 2013. Australian University Students' Attitudes Towards the Use of Prescription Stimulants as Cognitive Enhancers: Perceived Patterns of Use, Efficacy and Safety. *Drug Alcohol Rev*, 32, 295-302.
- PERSSON, I. & SAVULESCU, J. 2008. The Perils of Cognitive Enhancement and the Urgent Imperative to Enhance the Moral Character of Humanity. *Journal of Applied Philosophy*, 25, 162-77.
- PORS DAM MANN, S. & SAHAKIAN, B. J. 2015. The Increasing Lifestyle Use of Modafinil by Healthy People: Safety and Ethical Issues. *Current Opinion in Behavioral Sciences*, 4, 136-41.
- PUGH, S. D. 2001. Service With a Smile: Emotional Contagion in the Service Encounter. *The Academy of Management Journal*, 44, 1018-27.
- PYCROFT, L., BOCCARD, S. G., OWEN, S. L., STEIN, J. F., FITZGERALD, J. J., GREEN, A. L. & AZIZ, T. Z. 2016. Brainjacking: Implant Security Issues in Invasive Neuromodulation. *World Neurosurg*, 92, 454-62.

- RANISCH, R., GAROFOLI, D. & DUBLJEVIC, V. 2013. "Clock Shock," Motivational Enhancement, and Performance Maintenance in Adderall Use. *AJOB Neuroscience*, 4, 13-14.
- SAHAKIAN, B. J. & LABUZETTA, J. N. 2013. *Bad Moves : How Decision Making Goes Wrong, and the Ethics of Smart Drugs*, Oxford, Oxford University Press.
- SALE, K. 1995. *Rebels Against the Future : the Luddites and their War on the Industrial Revolution : Lessons for the Computer Age*, Reading, Mass., Addison-Wesley Pub. Co.
- SANTONI DE SIO, F., FAULMÜLLER, N. & VINCENT, N. A. 2014. How Cognitive Enhancement Can Change our Duties. *Front Syst Neurosci*, 8.
- SENTENTIA, W. 2013. Freedom by Design: Transhumanist Values and Cognitive Liberty. In: MORE, M. & VITA-MORE, N. (eds.) *The Transhumanist Reader: Classical and Contemporary Essays on the Science, Technology, and Philosophy of the Human Future*. Oxford: John Wiley & Sons, 355-60.
- STEENBERGEN, L., SELLARO, R., HOMMEL, B., LINDENBERGER, U., KUHN, S. & COLZATO, L. S. 2016. "Unfocus" on foc.us: Commercial tDCS Headset Impairs Working Memory. *Exp Brain Res*, 234, 637-43.
- SUGDEN, C., HOUSDEN, C. R., AGGARWAL, R., SAHAKIAN, B. J. & DARZI, A. 2012. Effect of Pharmacological Enhancement on the Cognitive and Clinical Psychomotor Performance of Sleep-Deprived Doctors: a Randomized Controlled Trial. *Ann Surg*, 255 (2), 222-7.
- TUTTLE, B. 2015. Workers Are Being Fired for Refusing to Get Flu Shots. *Time* [Online]. Available: <http://time.com/money/4101787/flu-shot-mandatory-workers-fired/> [Accessed 17/7/2016].
- VINCENT, N. & JANE, E. A. 2014. Put Down the Smart Drugs - Cognitive Enhancement Is Ethically Risky Business. *The Conversation* [Online], 15th June. Available: <http://theconversation.com/put-down-the-smart-drugs-cognitive-enhancement-is-ethically-risky-business-27463> [Accessed 18/10/2014].
- VOLKOW, N. D., FOWLER, J. S., LOGAN, J., ALEXOFF, D., ZHU, W., TELANG, F., WANG, G. J., JAYNE, M., HOOKER, J. M., WONG, C., HUBBARD, B., CARTER, P., WARNER, D., KING, P., SHEA, C., XU, Y., MUENCH, L. & APELSKOG-TORRES, K. 2009. Effects of Modafinil on Dopamine and Dopamine Transporters in the Male Human Brain: Clinical Implications. *JAMA*, 301 (11), 1148-54.
- VRECKO, S. 2013. Just How Cognitive Is "Cognitive Enhancement"? On the Significance of Emotions in University Students' Experiences with Study Drugs. *AJOB Neuroscience*, 4 (1), 4-12.
- WHO/IARC. 2011. IARC Classifies Radiofrequency Electromagnetic Fields as Possibly Carcinogenic to Humans. May 31st. Available: http://www.iarc.fr/en/media-centre/pr/2011/pdfs/pr208_E.pdf [Accessed 31/10/14].
- ZACKIN, R. S., BOYARSKY, M. & JARUSIEWICZ, L. J. 2015. Telecommuting as an Accommodation – A Legal Quandary For Employers. *New Jersey Law Journal* [Online]. Available: [http://www.gibbonslaw.com/Files/Publication/8bce2eed-6b82-448e-80c3-2933fe125251/Presentation/PublicationAttachment/2c01d554-22b1-4422-8377-2db7cc27a5a4/NJLJ employment law supp Aug 2015.pdf](http://www.gibbonslaw.com/Files/Publication/8bce2eed-6b82-448e-80c3-2933fe125251/Presentation/PublicationAttachment/2c01d554-22b1-4422-8377-2db7cc27a5a4/NJLJ%20employment%20law%20supp%20Aug%202015.pdf) [Accessed 26/7/2016].

