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Should we biochemically enhance sexual fidelity?

ROBBIE ARRELL

Abstract
In certain corners of the moral enhancement debate, it has been suggested we ought to consider the prospect of supplementing conventional methods of enhancing sexual fidelity (e.g. relationship counselling, moral education, self-betterment, etc.) with biochemical fidelity enhancement methods. In surveying this argument, I begin from the conviction that generally-speaking moral enhancement ought to expectably attenuate (or at least not exacerbate) vulnerability. Assuming conventional methods of enhancing sexual fidelity are at least partially effective in this respect – e.g. that relationship counselling sometimes successfully attenuates the particular vulnerability victims of infidelity feel – then presumably the case for supplementing conventional methods with biochemical methods turns, in part, on the claim that doing so will better promote attenuation of victim vulnerability.

In this paper, I argue that on a sufficiently sophisticated conception of what this vulnerability consists in, biochemical methods of enhancing fidelity will not expectably attenuate victims' vulnerability. Moreover, when combined with conventional methods, biochemical methods will predictably tend to undermine whatever attenuation conventional methods expectably promote in that respect. Thus, I conclude that couples committed to saving their relationship following an instance of sexual infidelity have reason to prefer conventional methods of enhancing sexual fidelity *sans* biochemical methods to conventional methods *plus* biochemical methods.

1. Introduction

Sexual infidelity is bad.[1] Extra-pair sex is frequently cited as being amongst the most powerful predictors of relationship failure and/or divorce.[2] Cross-culturally, affronts to 'male sexual proprietariness'[3] resulting from sexual infidelities by women (actual or suspected) are a leading cause of spousal battering and spousal homicide. And then of course there are simply the painful experiences of anguish, psychological distress, depression, anger, betrayal, resentment and humiliation that commonly afflict victims of infidelity. Given this list of harms, sexual betrayals are oftentimes not obstacles to be overcome, but reasons to part ways. Other times, though, couples desire nothing more than to rescue their relationships and are willing to go to great lengths to make that happen. However, whilst conventional methods of mending faltering relationships such as relationship counselling are commonplace, the statistics suggest that such methods are, at best, only partially effective. According to some research, approximately one third of couples fail to realise any significant gains as a result of counselling, whilst 30-60% report significant deterioration in their relationship in studies that track marital satisfaction for two years or longer after counselling ends, with as many as 35% of couples divorced within four years of termination.[4]

In an intriguing turn in the moral enhancement debate, Brian D. Earp, Anders Sandberg, Julian Savulescu and Olga A. Wudarczyk have variously touted biochemical methods of enhancing sexual fidelity as a potential and even desirable solution to fidelity-related relationship woes.[5] Recent research in behavioural genetics and neuroscience suggests that certain of the counter-moral impulses that commonly contribute to relationship breakdown – amongst them the proclivity for extra-pair sexual intimacy – are, in part, biologically or genetically determined.[6] On the back of this research, and the great value to us that comes of partaking in loving and lasting relationships (as well as the disvalue of squandered love), Earp et al. have suggested 'it is time to move beyond merely *describing* the brain systems involved

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[1] I provide no real argument for this assertion here. I merely assume that if you value your partner's sexual fidelity, their being sexually unfaithful will constitute a harm to you. I also assume that being in a sexually open or otherwise non-monogamous relationship does not insulate against such harms; by the shared norms of even open or polygamous relationships there are still persons who are presumably deemed off-limits (e.g. partners' siblings, parents, friends, etc.), such that having sex with them would constitute a harmful sexual betrayal. For ease of exposition, I will also assume that sexual infidelity involves sexual intercourse. I do not as a matter of fact believe sexual infidelity requires intercourse, but the debate about what does constitute sexual infidelity is beyond the remit of this paper.

[2] Laura Betzig, 'Causes of Conjugal Dissolution: A Cross-cultural Study', *Current Anthropology* 30 (1989), 654–676; Paul R. Amato and Denise Previti, 'People's Reasons for Divorcing: Gender, Social Class, the Life Course, and Adjustment', *Journal of Family Issues* 24 (2003), 602–626.

[3] Martin Daly and Margo Wilson, 'Evolutionary Social Psychology and Family Homicide', *Science* 242 (1988), 519–524, at 521.

[4] Douglas K. Snyder, Angela M. Castellani and Mark A. Whisman, 'Current Status and Future Directions in Couple Therapy', *Annual Review of Psychology* 57 (2006), 317–344.

[5] Julian Savulescu and Anders Sandberg, 'Neuroenhancement of Love and Marriage: The Chemicals Between Us', *Neuroethics* 1 (2008), 31–44; Brian D. Earp, Anders Sandberg and Julian Savulescu, 'Natural Selection, Childrearing, and the Ethics of Marriage (and Divorce): Building a Case for the Neuroenhancement of Human Relationships', *Philosophy & Technology* 25 (2012), 561–587; Brian D. Earp, Olga A. Wudarczyk, Anders Sandberg and Julian Savulescu, 'If I Could Just Stop Loving You: Anti-Love Biotechnology and the Ethics of a Chemical Breakup', *The American Journal of Bioethics* 13 (2013), 3–17.

[6] Justin R. Garcia, James MacKillop, Edward L. Aller, Ann M. Merriwether, David Sloan Wilson and J. Koji Lum, 'Associations between Dopamine D4 Receptor Gene Variation with Both Infidelity and Sexual Promiscuity', *PLoS One* 5 (2010), e14162.; Brendan P. Zietsch, Lars Westberg, Pekka Santtila and Patrick Jern, 'Genetic analysis of human extrapair mating: heritability, between-sex correlation, and receptor genes for vasopressin and oxytocin', *Evolution and Human Behaviour* 36 (2015), 130–136.

in love, attachment and commitment; we should begin to think about *intervening* in those systems directly, to give love a helping hand'.[7]

At first blush, the prospect of deploying 'love drugs'[8] to enhance relationships strikes many as worrisome, and reservations about their desirability abound. These include doubts about efficacy (could biotechnologies realise the intrinsic good of love at all?); concerns about restrictions of freedom (is the freedom to form and act upon morally suboptimal motives perhaps valuable in its own right, even if the bad motives and acts themselves are not?); fears surrounding authenticity (would a bioenhanced love be an 'authentic' love of the kind we generally desire?); and worries about misuse (is there a risk love drugs will be forced on recalcitrant partners? Or perhaps even used to sustain bad relationships?). I mention these reservations only fleetingly here since they arguably all presuppose the success of a prior claim which is the concern of this paper: that biochemical methods of morally enhancing relationships expectably attenuate (or at least do not exacerbate) vulnerability. If this is not so, as I argue it isn't in the case of sexual fidelity bioenhancements, the independent objections these concerns foreground are superfluous.

In the opening section of this paper, I motivate the claim that generally-speaking moral enhancement ought to expectably attenuate vulnerability. Assuming conventional methods of morally enhancing sexual fidelity are at least partially effective in this respect – e.g. that relationship counselling sometimes successfully attenuates the particular vulnerability victims of infidelity experience – then presumably the case for supplementing conventional methods with biochemical methods presupposes that doing so will better promote attenuation of victim vulnerability. In order to explore whether that is so or not, I go on in the next section to construct a hypothetical case of a couple committed to rescuing their relationship following an instance of sexual infidelity. In assessing that case, the question is not whether it is actually possible to biochemically modulate sexual fidelity (I assume it is); nor is it whether a 'fidelity drug' of sorts would work (I assume it works precisely as intended); and nor is it whether it would be morally permissible for the couple in question to deploy fidelity drugs (I assume it is). Rather, the driving question is whether – even with these assumptions in place – the couple have good reason to introduce fidelity drugs into their relationship therapy regime. In section four, I suggest not, for on a sufficiently sophisticated conception of what vulnerability born of sexual infidelity consists in, fidelity drugs will not expectably attenuate victims' vulnerability. Moreover, when fidelity drugs are introduced into therapy regimes alongside conventional methods like counselling, they will predictably tend to undermine whatever attenuation conventional methods expectably promote in that respect. Thus, in section five, I conclude that couples committed to saving their relationship following an instance of sexual infidelity have presumptively decisive reason to prefer conventional methods of morally enhancing sexual fidelity *sans* biochemical methods to conventional methods *plus* biochemical methods. In the final section I canvas two objections.

2. Moral enhancement and vulnerability

Thomas Douglas defines moral enhancement thus: 'A person morally enhances herself if she alters herself in a way that may reasonably be expected to result in her having morally better future motives, taken in sum, than she would otherwise have had'.[9] That usefully clarifies what moral enhancement consists in, but what, we may yet ask, is its end? David DeGrazia's model

[7] Earp et al., 'Natural Selection, Childrearing, and the Ethics of Marriage (and Divorce)', 583. Emphasis in original.
[8] Savulescu and Sandberg, 'Neuroenhancement of Love and Marriage', 37.
[9] Thomas Douglas, 'Moral Enhancement', *Journal of Applied Philosophy* 25 (2008), 228–245, at 229.

which distinguishes three mutually supportive functions of moral enhancement suggests a response to that further question:

1. *Motivational improvement*: better motives, character traits and overall motivation to do what is right.
2. *Improved insight*: better understanding – accessible when decisions are needed – of what is right.
3. *Behavioural improvement*: greater conformity to appropriate moral norms and therefore a higher frequency of right action.[10]

DeGrazia proposes that motivational improvement and improved insight, whether promoted in conjunction or independently, conduce to behavioural improvement. And since '*[b]ehavioural improvement is highly desirable in the interest of making the world a better place and securing better lives for human beings and other sentient beings*',[11] moral enhancement is therefore desirable. Notably, neither improvements of motivation or insight, nor the behavioural improvements they conduce to, are themselves the ends. Rather, the end of moral enhancement is to make the world a better and safer place for human and non-human beings alike. Thus, motivational, epistemic and behavioural improvements fostered by moral enhancement are desirable, in part, for the concomitant attenuation of vulnerability such improvements expectably promote.

This notion – that attenuation of vulnerability is a core end of moral enhancement – is oft-implied in the literature, though rarely made explicit. For example, Douglas's defence of moral bioenhancement against the 'Bioconservative Thesis'[12] demonstrably lends itself to such an interpretation. The Bioconservative Thesis posits that whilst bioenhancement of physical ability, intelligence, cognitive capacity, etc. might benefit enhanced individuals, such enhancements risk introducing a manifestly unjust social stratification of enhanced/unenhanced. A world in which an elite bioenhanced stratum are able to run faster and jump higher (both literally and metaphorically) would foreseeably disadvantage and exacerbate the vulnerability of those for whom bioenhancement is not within reach. Therefore, bioenhancement is morally impermissible. However, Douglas rejects this objection as indecisive *vis-à-vis* moral bioenhancement. He contends that, unlike cognitive or physical bioenhancements, *moral* bioenhancements 'could not easily be criticised on the ground that their use by some would disadvantage others. On any plausible moral theory, a person's having morally better motives will tend to be to the advantage of others'.[13] If Douglas is right, then the Bioconservative Thesis – that bioenhancement generally is impermissible because it exacerbates the vulnerability of the unenhanced – is false.

If Douglas's negative argument saved moral bioenhancement from the charge that bioenhancements generally exacerbate vulnerability, it simultaneously paved the way for positive arguments in favour of moral bioenhancements. For if it is generally true of moral bioenhancements that what is good for the goose is good for the gaggle, their increased uptake is in principle concordant with promoting attenuation of vulnerability globally (i.e. amongst enhanced and unenhanced alike), or at least not in competition with that end. And nowhere is the pressing need to diminish our vulnerability to harm so pivotally deployed in defence of the

[10] David DeGrazia, 'Moral enhancement, freedom, and what we (should) value in moral behaviour', *Journal of Medical Ethics* 40 (2014), 361–368, at 362–363. Emphasis in original.
[11] DeGrazia, 'Moral enhancement, freedom, and what we (should) value in moral behaviour', 363. Emphasis in original.
[12] Douglas, 'Moral Enhancement', 229.
[13] Douglas, 'Moral Enhancement', 230.

moral enhancement project as in the works of Ingmar Persson and Julian Savulescu.[14] They observe that the *status quo* of moral behaviour is disconcertingly unsatisfactory, pointing out that conventional methods of moral enhancement such as moral education, socialisation, public policies and self-improvement have thus far proved, at best, modestly effective in averting pressing contemporary crises such as climate change and poverty. And things are only set to get worse it seems. Given the increasing risk of catastrophic eventualities that accompanies exponential technological innovation and expansion, they worry that already off-the-pace conventional methods will fare even worse going forward. As the title of Persson and Savulescu's book suggests, our evolved social and psychobiological natures have, it would seem, left us *Unfit for the Future*.[15] Since conventional methods of moral enhancement have thus far proved so unequal to the task of attenuating or even abating vulnerability risks, they argue that moral bioenhancement deserves our serious consideration as a prospective (and perhaps only) way out of the corner humanity has backed itself into.

Whether civilisation can rescue itself from itself via moral bioenhancement is a question for another time, and the argument presented here cannot and should not be read as a jeremiad against moral bioenhancement generally. The purpose here is merely to motivate an end common to all modes of moral bioenhancement, not an objection that necessarily afflicts all modes of moral bioenhancement in common. If one such common end is, as I conjecture, attenuation of vulnerability, then plausibly one of the first questions we should ask when assessing any particular mode of moral bioenhancement is: will it expectably attenuate (or at least not exacerbate) vulnerability? If the answer is yes (as I believe it is with respect to the more general modes of moral bioenhancement Persson and Savulescu endorse), then proceeding to address further questions concerning authenticity, coercion, freedom, misappropriation, societal implications, etc. may be warranted; but if the answer is no, then however philosophically interesting such questions may be, that may be all they are.

Thus parsed, the question that informs the remainder of this paper is this: would supplementing conventional methods of enhancing sexual fidelity with biochemical methods – or 'fidelity drugs' – expectably attenuate (or at least not exacerbate) the vulnerability victims typically experience in the wake of instances of sexual infidelity?

3. Fidelity Actually[16]

Biotechnologies designed to enhance sexual fidelity specifically have not received much focused attention in the literature, but the potentiality of them is often invoked (most squarely by Earp et al.) in a supporting role as part of a suite of possible relationship neuroenhancements:

> Just like fidelity, adultery appears to be heavily influenced by brain and even gene-level factors. Variations in a dopamine receptor gene have been found to correlate in humans with infidelity and sexual promiscuity (Garcia et al. 2010). This outcome might be carried out through effects on libido, sensation-seeking, or impulsivity. Similar findings have been reported in rodents (Curtis et al. 2006). Infidelity may also occur through less direct routes—stemming from asymmetrical sexual interests between partners, for instance. As relationships outlast their evolved

[14] Ingmar Persson and Julian Savulescu, *Unfit for the Future: The Need for Moral Enhancement* (Oxford: Oxford University Press, 2012); Ingmar Persson and Julian Savulescu, 'Moral Enhancement, Freedom and the God Machine', *Monist* 95 (2012), 399–421; Ingmar Persson and Julian Savulescu, 'Getting Moral Enhancement Right: The Desirability of Moral Bioenhancement', *Bioethics* 27 (2013), 124–131.

[15] Persson and Savulescu, *Unfit for the Future*.

[16] The Harry and Karen case introduced in this section is loosely adapted from the storyline involving those characters (played by Alan Rickman and Emma Thompson) in the 2003 Richard Curtis film *Love Actually*.

> scaffolding, disparities in sexual desire between men and women tend to expand (Klusmann 2002, 2006): in the typical pattern, men whose libido remains constant while their wives' begins to wane disproportionately seek sexual fulfilment outside the relationship (Buss 1994). By heightening sexual desire in the less aroused partner (by using testosterone, for instance, see Braunstein et al. 2005; Sherwin 2002; Sherwin and Gelfand 1987; Sherwin et al. 1985) or reducing it in the more aroused partner, the discrepancy could be minimized, possibly softening a major source of relationship strain. In fact, testosterone levels fall naturally in men upon marriage or the birth of a child and rise naturally at a relationship's end (to encourage novel mate-seeking behaviors, see Eastwick 2009): deliberately moderating these levels in the right way could promote male parenting and discourage a wandering eye.[17]

Given such advances in our understanding of the psychobiological underpinnings of monogamy, sexual fidelity, attraction, etc., the prospect of fidelity drugs is not a far-fetched one. Moreover, fidelity drugs are in certain respects arguably more appealing than love drugs. For whilst perhaps few would want their partner's love to be caused or sustained by drugs, if the partner's tendency to bestow loving care on their beloved is there but impaired by some psychobiological feature that may be biochemically manipulated into submission, then many of the standard objections to bioenhancing love *per se* lose much of their force. The fact is that even otherwise loving partners sometimes lie, and sometimes they cheat. If, as the neuroscientific research suggests, the proclivity for extra-pair sexual activity is in part biologically determined and we could attenuate it via biochemical manipulation, should we?

We can easily imagine cases in which we would (and should) say no, but it is equally plausible to construct more favourable cases. Suppose Harry and Karen have been married for 25 years and are still very much in love. However, whilst Karen's interest in sex has waned over the years, Harry's has remained relatively constant. Harry is the managing director of a design agency, and finds himself subject to increasingly overt sexual advances from his attractive young secretary Mia. Despite managing to resist the temptation initially, his resolve ultimately deserts him and he ends up embarking upon a sexual affair with Mia. Karen discovers the affair and is unsurprisingly devastated. However, upon confronting Harry about it, she sees that he is profoundly regretful of his indiscretion and believes him when he says he still loves her. After talking it through openly and honestly, they reach a joint decision that they do not want to give up on their marriage and both commit to doing their level best, whatever that may entail, to save it. The first thing they do is start seeing a relationship counsellor. After a number of sessions, the counsellor tells them about a new fidelity drug. She never mentioned it earlier because she only recommends this particular treatment to couples once she is convinced (a) that neither party is coercing the other to attend; and (b) that the love they share, though tarnished, is genuine and authentic in both directions. Having decreed that these criteria are satisfied, their counsellor proceeds to explain that all the drug will do is modulate Harry's psychobiology so as to diminish his proclivity for extra-pair sexual activity, and that there are no adverse side effects. In addition, she stresses to them that (c) the effect of the drug is merely to inhibit the impulse to engage in extra-pair copulation, not eliminate it. And finally, she assures them that (d) the drug will not immutably alter Harry's psychobiology, and he is free to unilaterally terminate the course of treatment at any time (as is Karen).

The hypothetical scenario is stylized so as to nullify a number of standard objections to the neuroenhancement of relationships. Firstly, (a) mitigates concerns surrounding coercion or

[17] Earp et al., 'Natural Selection, Childrearing, and the Ethics of Marriage (and Divorce)', 583. Parenthetical references in original.

offence against individual or marital autonomy. Secondly, (b) allows us to fence off concerns about preserving bad or damaging relationships, as well as authenticity issues. Harry and Karen's relationship is not unhealthy or oppressive, and whilst authenticity might be an issue if love drugs are used to cause or create love where none previously existed, it is less troublesome in cases like this where the authenticity is already there and not in question. Thirdly, (c) circumvents the objection that the virtue of fidelity requires the possibility of infidelity, since the possibility that Harry will be unfaithful remains live, just less probable. (c) also dilutes the objection that bioenhanced Harry would lack the freedom to form and act upon the motive to sleep with other women which might itself be valuable even if the bad motives and acts are not. Harry's freedom is perhaps restricted, but by no means vanquished, and it is difficult to see any problem with this kind of self-imposed voluntary restriction of freedom providing it is fully informed. Finally, whatever one might think about temporally restricted Ulysses Pacts – e.g. the pact Ulysses himself made with his crew that they bind him to the ship's mast until out of earshot of the Sirens' songs (from which the term derives) – to metaphorically bind oneself to the mast once and for all time is apt to strike some as troublesome, hence the inclusion of (d).

With these conditions *in situ*, I think Earp et al. might say (as they do of love drugs generally) that the couple should at least 'be at *liberty* to use love drugs, and that they may have several good *reasons* to do so as well'.[18] The first part of this statement need not detain us. I doubt there exist many methods (conventional or otherwise) of enhancing sexual fidelity that could be deemed morally impermissible, once the kinds of background conditions built into the Harry and Karen case are satisfied. It is the second part that interest me. Elsewhere, Earp et al. similarly lay claim to establishing 'a reasonable initial case for the moral permissibility – even prudence – of attempting drug-based modification of love and love-related phenomena for at least some individuals and some couples'.[19] However, it is not always prudent to do that which is morally permissible. And so the question remains: do Harry and Karen have good reason to deploy the fidelity drug?

Suppose the only expectable consequences of taking the fidelity drug for Harry will be: (i) an alteration of his psychobiology in those (and only those) ways necessary to curtail his desire for extra-pair sexual activity; (ii) enhancement of his '"bigger picture" decision-making autonomy'[20] as his higher order goals are freed from the shackles of his lower order psychobiological urges; and (iii) promotion of the probability that he will be faithful. If the end of moral enhancement is moral improvement in motivations, insight and behaviour, and (by hypothesis) the fidelity drug improves Harry in these respects, then it would seem the couple do indeed have good reason to introduce the fidelity drug into their relationship therapy regime.

But this is too quick. The consequences for Harry are surely not the only relevant (or perhaps even most important) consequential considerations in the vicinity. In order to reach a fully informed position on whether the couple have good reason to deploy the fidelity drug, we also need to consider the expected consequences of Harry's bioenhancement for Karen. Three candidate consequences in particular warrant detailed analysis.

3.1 Promotion of the probability of fidelity

The first and most obvious expected consequence of Harry's bioenhancement for Karen would be promotion of the probability that he will in future be faithful. This would seem like a positive

[18] Earp et al., 'Natural Selection, Childrearing, and the Ethics of Marriage (and Divorce)', 562. Emphasis in original.
[19] Brian D. Earp, Anders Sandberg and Julian Savulescu, 'Brave New Love: The Threat of High-Tech "Conversion" Therapy and the Bio-Oppression of Sexual Minorities', *AJOB Neuroscience* 5 (2014), 4–12, at 5.
[20] Earp et al., 'Brave New Love', 4–5.

consequence for Karen. However, on refection, it is not clear that how probable it is that one's partner will comply with their duty to be faithful really matters. As Philip Pettit has argued, robustly demanding goods like fidelity tend by nature to be probabilistically insensitive.[21] Suppose Harry attends a work party where there are two women seeking a sexual encounter, and by the aesthetic standards of one – Mia – he is judged attractive, whilst by the standards of the other – Sarah – he is not. If the utility to Karen of Harry complying with his duty to be faithful is the same with respect to both women, and both are equally desirous of attractive men (despite their divergent subjective aesthetic standards), the probability of Karen's realising the utility of Harry's compliance with his duty to be faithful is lower with respect to Sarah who deems him unattractive, and higher with respect to Mia who deems him very attractive. Thus, assuming the expected utility to Karen of Harry's fidelity = utility x probability, and the probability of Harry having to comply with his duty to be faithful is higher with respect to Mia, then it should count for less with Karen if he buckles and sleeps with Sarah than if he buckles and sleeps with Mia. But this seems deeply counterintuitive (and, I suspect, deeply irrelevant to Karen).

Moreover, if ramping up the probability that Harry will not be unfaithful again were what really mattered to Karen, alternative more effective methods should surely be preferred to the fidelity drug (which, by hypothesis, merely reduces the likelihood that Harry will be unfaithful). For example, if Harry were instead to agree to don a male chastity device whenever out of Karen's sight from now on, the probability of his being faithful would presumably be 1. The fact that intuitively there seems something amiss in relying on such strategies suggests that, although fidelity drugs would reduce the likelihood of sexual indiscretions, this is not what really matters (or at least it is not all that matters). If there is good reason from Karen's perspective as the victim of infidelity to introduce the fidelity drug into their therapy programme, it seems the explanation of why that is must derive from something over and beyond the expectation that it will promote the probability that Harry will in future remain faithful.

3.2 Reduced likelihood of exposure to negative reactive emotions

A second predictable consequence of Harry's bioenhancement for Karen would be a decreased likelihood that she will experience a repeat of the kinds of negative reactive emotions the initial sexual betrayal provoked. Presuming Karen hopes to never again experience the betrayal, humiliation and resentment Harry's sexual indiscretion sparked in her, this looks like another welcome consequence. But this cannot be the whole story either. Suppose upon discovering the affair Karen immediately presses Harry to reveal how long it has been going on, and he admits that it began six months ago. Karen might feel that, right there and then, at the moment of revelation, she is robbed of the good of Harry's fidelity. Or, she might feel that whatever good of Harry's fidelity she 'thought' she enjoyed was dashed six months ago the moment he leapt into bed with Mia for the first time. Intuitively, the right conclusion is the latter. Yet, if what really mattered to Karen in desiring Harry's fidelity were the insulation against betrayal, humiliation and resentment she enjoys as a result, and if it is only at the moment of revelation that those negative emotions 'react' in her, then there would be no reason to think the second conclusion should follow more readily than the first. That it does, suggests there must be more to the story of fidelity and why it matters than the fact that it insulates against negative reactive emotions. So, again, if it is a good idea from Karen's perspective to deploy the fidelity drug, the basis for that must be something more than the mere fact that Harry's bioenhancement

[21] Philip Pettit, *The Robust Demands of the Good* (Oxford: Oxford University Press, 2015), at 111–115.

would expectably decrease the likelihood that she will in future experience the negative emotions that go hand-in-hand with being a victim of sexual infidelity.

3.3 Attenuation of vulnerability

If the two expected consequences of fidelity bioenhancement just canvassed do not really matter (or at least they alone do not matter), what does? I propose there is a third expectable consequence of Harry's bioenhancement that Karen might desire above promotion of the probability that Harry will in future be faithful, and the decreased likelihood of being put through the emotional wringer again (though of course she desires these too). This third consequence of Harry's bioenhancement is attenuation of the heightened vulnerability Karen experiences in the wake of his sexual indiscretion.

The relevant conception of vulnerability here is that of vulnerability to another's free will developed by Pettit.[22] The basic idea stems from what seems a truism of romantic relationships: that sharing a romantic relationship with someone typically renders you vulnerable to certain special kinds of wrongs and betrayals they are uniquely placed to inflict upon you.[23] After all, in virtue of being an agent to whom you ascribe free will, your partner is practically-speaking free to enact all kinds of options across choice-sets relevant to your welfare: they are free to be unfaithful should they so choose, or not; free to abuse you, or not; free to walk out on you, or not; and so on. Since in these kinds of choice-sets there is no practical barrier to prevent them from choosing one option or the other, you are in effect subject to their power to impose/withhold those harms. To be subject to the will of another in this way is to be vulnerable. Ordinarily, however, knowing with reasonable confidence that your partner is appropriately disposed to accord your interests special deliberative significance across choice sets relevant to your welfare provides you with valuable protection against the expansive exercise of their will. For in virtue of their being so disposed, the range of deliberative options that populate their choice sets are self-restricted in a way that attenuates your vulnerability to being hurt by them. Indeed, if all is well in this respect, many of the options your partner is practically free to enact – e.g. to sleep around, abuse you, or walk out on you without explanation – will not register as options at all, being ring-fenced outside of the range of your partner's relevant choice-sets properly restricted.

Having sketched the details of Pettit's conception of vulnerability, we begin to see more clearly the particular character of the harm Harry's sexual infidelity wreaks on Karen and their marriage. At the time of embarking on his affair with Mia, Harry was practically free to enact either of two options: remain faithful, or be unfaithful. In choosing the latter, Harry opted to wrong Karen (the refrain "I didn't mean to hurt you – it just happened!" doesn't change the fact that he freely chose to cheat over the equally practically viable option of not cheating). As a result, Karen's confidence that Harry is appropriately disposed to be robustly faithful to her (of which she previously felt reasonably assured) is shattered. Importantly, what Karen loses confidence in is not Harry's disposition to be faithful *as such*. Rather, what she is stripped of is the confidence she had (pre-affair) that Harry's disposition to be faithful is sufficient to

[22] Pettit, *The Robust Demands of the Good*, 120–137.

[23] More specifically, your partner is capable of inflicting certain wrongs on you or hurting you in ways that strangers are not; i.e. wrongs rendered 'special' in virtue of facts about the special relationship you share. Strangers are of course perfectly capable of imposing on you all sorts of general harms or wrongs, but it would be bizarre to charge a stranger with the wrong of being sexually unfaithful to you in the absence of any kind of sexually exclusive relationship between you. Additionally, even when a stranger is capable of inflicting a wrong on you that is qualitatively similar to some wrong your partner might inflict on you, the partner-inflicted wrong will be special in a manner that the stranger-inflicted wrong cannot be, since in addition to the substantive wrong suffered the former also comprises a betrayal. This is why it feels worse if your partner steals money from your bank account than if an anonymous hacker steals from your account, even when the sum stolen is the same.

ensure he robustly refrains from engaging in extra-marital sex. In other words, what she previously believed – that Harry is sufficiently well disposed to refrain from sleeping with other women, not just across scenarios in which doing so comes easy (e.g. scenarios in which no-one sexually propositions him), but also across scenarios in which doing so does not (e.g. the scenario in which Mia sexually propositions him) – no longer holds.

Thus, what Karen doubts (post-affair) is not so much that Harry wants to be faithful to her, but that his wanting to be faithful is enough to ensure he actually will be (or to warrant confidence on her part that he will be). And it is this worry which reduces her to a state of vulnerability, stripped of the valuable protection from Harry's free will she once enjoyed. To give their marriage a fighting chance, then, it is imperative the couple alight on a therapy regime that not only promotes the probability that, in future, Harry will be faithful, but also (and crucially) restores Karen's confidence that he is appropriately disposed to be. For as long as Karen remains plagued by doubts about whether Harry is able to 'keep it in his pants', not just when no-one is trying to get in his pants anyway, but also when attractive younger women like Mia are, attenuation of the heightened vulnerability to Harry's will she experiences in the wake of his affair will elude her. So, the question is: would introducing the fidelity drug into their therapy regime foster restoration of Karen's confidence in Harry's disposition to be robustly faithful?

4. The problem with fidelity drugs

It seems to me highly unlikely that administering the fidelity drug to Harry would do much, if anything, to bolster Karen's confidence that he is sufficiently well disposed to robustly refrain from sleeping with other women. And that is so, even in this highly stylized case where, by hypothesis, the fidelity drug successfully: (i) promotes the probability that Harry will be faithful; (ii) enhances Harry's '"bigger picture" decision-making autonomy'[24]; and (iii) decreases the likelihood of Karen experiencing painful emotions of resentment, humiliation and betrayal. That is, even despite the fact that the drug has, for all intents and purposes, 'morally enhanced' Harry precisely as intended. However, I think the reason the fidelity drug won't foster restoration of Karen's confidence in the sufficiency of Harry's disposition *vis-à-vis* fidelity (and thus won't attenuate the heightened vulnerability she experiences post-affair), has little to do with its being a drug. In fact, the 'biochemical'/'conventional' distinction is perhaps not all that pertinent here at all. The more relevant distinction is that between 'noncognitive' methods of enhancing fidelity – i.e. methods of inhibiting the proclivity or physical capacity for extra-pair sex that do not directly aim at correcting or preventing errors of moral cognition; and 'cognitive' methods that do – i.e. methods that promote sexually faithful behaviour via cognition-improving means.[25] Relationship counselling is a species-type of the latter and fidelity drugs a species-type of the former, but the correspondence across the two distinctions here is merely contingent. That is, not all biochemical enhancement methods are 'noncognitive', and nor are all conventional enhancement methods 'cognitive'.

A prosaic example of a conventional noncognitive method of enhancing sexual fidelity is the issuing of threats; e.g. if you cheat on me again I will leave you, take the kids, take your money, kill myself, kill you, etc. By imposing external constraints and/or high costs, such threats might more or less successfully promote the probability that your partner will be faithful and decrease the likelihood of you experiencing the emotional anguish of being cheated on. However, to the extent that you are reliant on threats for protection against being sexually betrayed by your partner, you are scarcely likely to feel much less vulnerable (in the sense

[24] Earp et al., 'Brave New Love', 4–5.

[25] For an illuminating discussion of noncognitive moral enhancements, see Douglas, 'Moral Enhancement via Direct Emotion Modulation', 160–168.

previously outlined) to being sexually betrayed by them. And something similar, I think, would also hold for more 'technological' noncognitive fidelity enhancers such as chastity devices voluntarily donned by philandering partners committed to mending their ways. For, again, if the only way your partner can prevent himself from cheating on you – despite being generally (albeit apparently insufficiently) disposed not to – is to bind himself to the mast so to speak (or his mast to himself for that matter), it seems unlikely you would feel much less vulnerable for all that.

In any case, it may be that Earp et al. would themselves reject deploying threats and chastity devices as methods of enhancing fidelity, since arguably neither satisfy the four criteria they posit as necessary and sufficient conditions in their ethical framework for the responsible use of anti-love biotechnologies:[26]

1. The love [or sexual desire for someone other than the person's spouse] would be clearly harmful and in need of dissolving one way or another.
2. The person would have to want to use the technology, so that there would be no problematic violations of consent.
3. The technology would help the person follow her higher order goals instead of her lower order feelings, thereby enhancing her "bigger picture" decision-making autonomy.
4. It might not be psychologically possible to overcome the perilous feelings without the help of anti-love biotechnology – or at least more "traditional" methods had already been tried or thoroughly considered.[27]

Threats would presumably fail to satisfy criteria 2 and 3; and since chastity devices merely prevent philanderers from doing what they want *in the moment* to do (i.e. have sex with someone they shouldn't) it might seem a stretch to think they would enhance the trussed-up philanderer's bigger picture decision-making autonomy (criterion 3). However, I think a strong case can be made to say that all four conditions are satisfied in the Harry and Karen scenario where the noncognitive biotechnology in question is the fidelity drug. Criteria 1 and 2 are straightforwardly satisfied. 4 is satisfied since 'traditional' methods like self-control and will-power have evidently already failed Harry, and we can also assume the relationship counselling has thus far proven inadequate to allay his fears that he might stray again. And 3 looks to be satisfied too, for, unlike a chastity device, the fidelity drug wouldn't merely prevent Harry from doing what he wants *in the moment* to do (i.e. have sex with someone he shouldn't); rather it might prevent him from wanting to do it at all, thus unshackling his higher order goals.

It is hardly surprising, of course, that a biotechnology could meet Earp et al.'s criteria for the responsible use of biotechnologies, but it is not insignificant that even a low level noncognitive biotechnology like the fidelity drug portrayed here gets through. On what we should say about neuroenhancing relationships via artificially boosting oxytocin, vasopressin, dopamine, etc. to promote pair-bonding, or even the theoretical possibility that we may one day be able to synthetically induce precise brain states characteristic of loving partners, I am somewhat undecided. Such possibilities are, to be sure, a worthwhile and important target of ethical inquiry, and Earp, Sandberg, Savulescu and Wudarczyk deserve plaudits for paving the way in this regard. However, I believe the ethical issues surrounding low-level noncognitive biotechnologies are perhaps more pressing, if only for the fact some are already in existence

[26] This is straightforwardly true insofar as threats and chastity devices are not 'biotechnologies', but plugging them into the authors' ethical framework for illustrative purposes should not, I hope, do them too great a disservice.

[27] Earp et al., 'Brave New Love', 5. The text that appears in brackets in the first criterion conveys detail from a footnote found therein in the original.

(and in some cases already in use). Consider, for example, the noncognitive sexual fidelity bioenhancement *par excellence*: chemical castration. Treatment of sexual deviancy via administration of anti-androgen drugs and more recently Lupron (both of which block testosterone production) is typically associated with sex offenders. However, in a relatively recent turn of events, medical centres like The Institute for Sexual Wellness in Weymouth, MA, have begun offering Lupron to voluntary patients seeking to curb illicit sexual behaviours, including serial infidelity.[28] Chemical castration of voluntary patients clearly meets Earp et al.'s four criteria. And, moreover, the fact that it does would apparently establish the 'strongest possible moral justification' for using chemical castration to dissolve 'what would seem to be "obviously" harmful forms of love or attraction', amongst which they list 'love that might lead to adultery'.[29]

And perhaps that's fine, as far as it goes, for in line with what I intimated earlier, I see no grounds for believing fidelity bioenhancement by chemical castration to be morally impermissible, providing reasonably strict background conditions are satisfied. Like all the noncognitive methods of enhancing sexual fidelity canvassed, chemical castration will expectably promote the probability that philanderers will be faithful. Moreover, being noncognitive does not render chemical castration incapable of promoting moral enhancement. This is straightforwardly true if the bar for moral enhancement is set relatively low – if it merely has to make it less likely that philanderers will philander (i.e. act immorally). But it is also arguably true even if the bar sits somewhat higher – if it has to make philanderers 'more moral'. For it is not inconceivable that, despite not being directly aimed at correcting or preventing errors of moral cognition, noncognitive biotechnologies might, over time, conduce (indirectly) to moral betterment. Furthermore, the fact that biotechnologies like chemical castration are noncognitive need not rule out their adoption being motivated by moral reasoning. Thus, if philanderers are moved by moral considerations (pertaining to their partners, families, etc.) to undergo chemical castration, and doing so does indeed result in their moral enhancement, then enhancing sexual fidelity via chemical castration looks like something they should be morally permitted to do.

The problem, however, is that it simply doesn't follow straightforwardly from the fact that chemical castration or noncognitive fidelity drugs generally are morally permissible that couples therefore have good reason to deploy them. That might follow if one accepts Douglas's claim quoted back in section 2: that '[o]n any plausible moral theory, a person's having morally better motives will tend to be to the advantage of others'.[30] But that is just not true of *all* forms of moral enhancement. Or, at least, it isn't if we take seriously the claim that the end of moral enhancement is attenuation of vulnerability. That said, it perhaps is true of *most* forms of moral enhancement (hence the earlier caveat that this argument cannot and should not to be read as an objection to moral enhancement generally). If I take a drug that makes me more empathetic and thus less likely to act immorally towards you, *ipso facto* your vulnerability is attenuated. Or, if someone with a strong aversion to certain racial groups takes a drug that inhibits their racism, thus making them less likely to act immorally towards persons from those racial groups, *ipso facto* the vulnerability of those persons is attenuated.[31] But, if Harry takes a fidelity drug that inhibits his desire to sleep with other women, thus making him less likely to act immorally towards Karen, it simply doesn't follow that *ipso facto* Karen's vulnerability is attenuated. No doubt vulnerability to the kinds of special wrongs and betrayals that only those with whom you

[28] Tsoulis-Reay, Alexa, 'What It's Like to Be Chemically Castrated', *New York Magazine* (December, 2015), available at: http://nymag.com/scienceofus/2015/11/what-its-like-to-be-chemically-castrated.html [accessed 2 June 2017].
[29] Earp et al., 'If I Could Just Stop Loving You', 10.
[30] Douglas, 'Moral Enhancement', 230.
[31] Douglas, 'Moral Enhancement', 231.

share special relationships (e.g. partners, friends, parents, children, siblings, etc.) are capable of inflicting upon you is quite unlike the vulnerability of persons subject to racial discrimination, or indeed that of persons generally. But vulnerability it is, nonetheless.

Fidelity drugs might make it more likely that Harry will refrain from sleeping with other women; and they might make it less likely that Karen will again experience the negative reactive emotions Harry's affair with Mia wrought upon her. But a lessening of the probabilities of these harms will not necessarily entail a lessening of the heightened vulnerability she experiences as a victim of infidelity. If the end of moral enhancement is not merely moral improvement of the enhanced patient (which the fidelity drug successfully effects), but attenuation of the vulnerability of enhanced and unenhanced alike, and if bioenhancement of Harry's sexual fidelity does not expectably attenuate Karen's vulnerability, then I think we should not recommend fidelity drugs as a solution to the kinds of fidelity issues couples like Harry and Karen face. Generalising, then, the first substantive conclusion of this paper is this: couples seeking to rescue their relationships following instances of sexual infidelity have presumptively decisive reason not to deploy fidelity drugs. That is, they have decisive reason to reject fidelity drugs if one of the things they reasonably hope for from a relationship therapy regime is attenuation of the heightened vulnerability the victim experiences in the aftermath of their partner's sexual infidelity.

5. The problem with supplementing conventional fidelity enhancement methods with fidelity drugs

Whilst I think this first conclusion is right, it is also weak in two respects. Firstly, 'the problem with fidelity drugs' exposed in the last section perhaps only establishes the fairly weak conclusion that couples have good reason not to deploy low level non-cognitive fidelity drugs *in lieu* of conventional methods. However, the role of biotechnologies is invariably depicted as one of supplementation rather than supplantation. In Earp et al.'s words: 'while neuroenhancement would not replace marriage counselling and other self-help methods, it could certainly supplement and improve those well-worn measures to good effect'.[32] Translated into the terms employed here, the equivalent claim would be: counselling *plus* fidelity drugs will better restore infidelity victims' confidence that their partners are sufficiently well disposed to be robustly faithful to them (thus better attenuating their vulnerability), than counselling *sans* fidelity drugs. If so, then couples have good reason to prefer counselling *plus* fidelity drugs to counselling *sans* fidelity drugs.

However, this seems unlikely, at least with respect to noncognitive fidelity bioenhancements. Administering fidelity drugs to philanderers will predictably impair the ability of their partners to ascertain that they are faithful because they are appropriately disposed to be, rather than for merely contingent reasons (e.g. because they are fidelity drugged). This is because supplementing counselling with fidelity drugs unavoidably introduces grounds for doubt otherwise absent in regimes comprised of counselling *sans* fidelity drugs. For example, if Harry and Karen opt for supplementing their counselling with the fidelity drug, Karen's epistemic position – her ability to ascertain with reasonable confidence that Harry's refraining from jumping into bed again with Mia or someone else is the result of his being appropriately disposed to be faithful to her – will be impaired relative to what it otherwise would have been.[33] Moreover, if they were to opt for counselling *plus* fidelity drugs, what the fact of the matter is about what stops Harry jumping into bed again with Mia

[32] Earp et al., 'Natural Selection, Childrearing, and the Ethics of Marriage (and Divorce)', 576.

[33] Indeed, not only might it never be as clear to Karen that bioenhanced Harry is faithful because he is appropriately and sufficiently disposed to be, and not for merely contingent reasons (e.g. because he is fidelity drugged), what the truth of the matter is will perhaps never be as clear even to Harry himself.

or anyone else – e.g. the Lupron duping the hormone in his brain that tells the pituitary gland to produce testosterone directly; or his disposition to be faithful flawlessly restored as an indirect result of the Lupron duping the hormone in his brain – is largely immaterial. All that matters is that, merely in virtue of folding the Lupron into the causal mix of their relationship therapy regime, Karen's epistemic ability to ascertain that Harry's renewed fidelity stems from his being appropriately disposed to be faithful to her will be impaired relative to what it would be were the Lupron not in his system. Thus, counselling *plus* fidelity drugs would predictably not better attenuate Karen's vulnerability to Harry's will than counselling *sans* fidelity drugs expectably would.

The second weakness issue is this: even if it is true that a fidelity drug would not expectably *attenuate* the vulnerability a victim of infidelity experiences, providing it does not *exacerbate* their vulnerability, then the first conclusion may seem less than fatal. However, if the previous response is plausible, and counselling *sans* fidelity drugs fares better than counselling *plus* fidelity drugs in terms of expectably attenuating the heightened vulnerability infidelity victims typically experience, then the second weakness issue is overcome too. One way to see this is to speculate about whether, or in what circumstances, a relationship counsellor would or should recommend fidelity drugs as a supplement to counselling. What if relationship counselling alone has not proved effective at all (i.e. it has done nothing whatsoever to assuage the heightened vulnerability the infidelity victim experiences)? Presumably not. Fidelity drugs should not be recommended as a supplement to failed counselling for the same reason that we should not endorse supplanting counselling with fidelity drugs: deployed *in lieu* of counselling (whether tried and failed, or never tried at all) they will not expectably attenuate victims' vulnerability. But what if counselling *is* proving effective? Presumably the counsellor should not recommend supplementary fidelity drugs even then, since their interposition will predictably undermine whatever gains in terms of attenuation of victim vulnerability the counselling has already realised. For the introduction of fidelity drugs into a relationship therapy regime that has thus far proved at least partially effective will inevitably introduce previously absent grounds for the victim to question the moral calibre and sufficiency of their partner's restored disposition to be faithful. If this is correct – i.e. we should not recommend fidelity drugs either as supplements or substitutes – we should not recommend biochemically enhancing sexual fidelity, period.

In the end, then, I suspect that not only will introducing fidelity drugs alongside conventional counselling techniques *not* 'supplement and improve those well-worn measures to good effect'[34]; I think folding fidelity drugs into the causal mix will actually tend to undermine whatever attenuation of vulnerability those 'well-worn measures' expectably promote (however imperfectly). If that is so, we can now reframe the initial 'weak' conclusion so as to yield a somewhat stronger, second substantive conclusion: couples seeking to rescue their relationship following instances of sexual infidelity have presumptively decisive reason to prefer conventional methods of enhancing sexual fidelity *sans* fidelity drugs to conventional methods *plus* fidelity drugs.

6. Final thoughts and objections

If all that you care about is that your partner just stops having sex with people they shouldn't, I suspect the arguments of this paper won't reach you. Indeed, fidelity drugs like Lupron might be just what you are looking for. It is with an eye to this that the reasons I have given for rejecting fidelity drugs are framed as 'presumptively decisive'. Yet, I think the presumption therein – that what many of us desire in desiring the fidelity of our partners is something more

[34] Earp et al., 'Natural Selection, Childrearing, and the Ethics of Marriage (and Divorce)', 576.

than that they merely refraining from illicit sex – is a reasonable one. Not all desires are like this, of course; in many situations desiring agents are indifferent as to the manner in which their desires are satisfied. Suppose your partner is an alcoholic and that you ardently desire that they cease drinking alcohol (for the sake of their health, your relationship, your family, etc.). It seems plausible to assume that you would be utterly indifferent as to whether your desire is satisfied (i.e. they cease drinking) as a result of their taking disulfiram, or as a result of their getting counselling. However, I think that, typically, in desiring that your partner stops cheating on you with other persons, you would not be indifferent as to whether your desire is satisfied (i.e. they stop cheating on you) as a result of their taking Lupron, or as a result of counselling. Sometimes what we desire, in desiring certain types of goods, is not mere non-frustration of that desire, and for many of us I think fidelity is a good of that type. The fact is, most of us have considered preferences concerning the manner in which we realise the good of fidelity in our relationships, and I think that to deny this would be to deny a feature of the phenomenological experience of fidelity. And, for what it's worth, I think Earp et al. would be no more willing to tread that path than I am, for they themselves see it as significant that 'most couples *as a matter of fact* value sexual fidelity'[35]. However, even if they are willing to come with me this far, I suspect there are (at least) two independent objections they might have.

6.1 Won't somebody think of the children?!

In Earp et al.'s paper on 'Natural Selection, Childrearing, and the Ethics of Marriage (and Divorce)', they argue that if troubled married couples have dependent children, their turning to biotechnologies to save their marriages might be not just permissible, but perhaps even morally obligatory.[36] Their argument begins from the premise that parents have a special obligation to protect their children from harm. Marriage failure and/or divorce is, generally speaking, detrimental to children. Since marriage failure/divorce goes hand-in-hand with adultery (statistically speaking), and since parents have 'an obligation (all else being equal) to preserve and enhance their relationships for the sake of their offspring', they should therefore refrain from adulterous behaviour. 'In many cases', they go on, '*the only way to do this* is through pharmacological intervention, in conjunction with other more conventional strategies like couple's therapy'[37]. Thus, supplementing conventional strategies (e.g. couple's therapy) with pharmacological interventions (e.g. fidelity drugs) can 'be justified from the perspective of child welfare…since extramarital sex can lead to the formation of extramarital bonds that could drive resources away from existing offspring'.[38]

If Harry and Karen have children, they will of course have parental obligations, and considerations pertaining to their children's welfare will indeed provide them with additional weighty reasons to try to save their marriage. However, it is not clear why the fact that this is so should dictate which method(s) of therapy they have reason to prefer so as to maximise the prospects of preserving and enhancing their marriage. The relevant question, rather, is whether couple's therapy *plus* fidelity drugs better promotes that end than couple's therapy *sans* fidelity drugs. If what has been argued here is correct, then the latter will expectably promote attenuation of Karen's vulnerability better than the former. And so, assuming that in general the level of vulnerability in a marriage is inversely correlated with the prospects of preserving it, Harry and Karen still ought to prefer couple's therapy *sans* fidelity drugs, even when there are children involved.

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[35] Earp et al., 'Natural Selection, Childrearing, and the Ethics of Marriage (and Divorce)', footnote 15, at 572.
[36] Earp et al., 'Natural Selection, Childrearing, and the Ethics of Marriage (and Divorce)', 562–564.
[37] Earp et al., 'Natural Selection, Childrearing, and the Ethics of Marriage (and Divorce)', 564. Emphasis in original.
[38] Earp et al., 'Natural Selection, Childrearing, and the Ethics of Marriage (and Divorce)', footnote 15, at 572.

6.2 The depression analogy

At another point in that same 2012 paper, Earp at al. speak of administering love drugs to give couples the boost they need to get '"over the initial hump" of their marital difficulties'. Doing so, they contend, would really be no different (morally speaking) to prescribing antidepressants to a patient 'whose brain chemistry may be so out of order that she requires a dose of medication to "get over the initial hump of her depression"'.[39] A similar analogy with treating depression also appears in Sandberg and Savulescu's 2008 paper on 'Neuroenhancement of Love and Marriage' in which they ask us to imagine a hypothetical case in which Betty's loving partner:

> John becomes prone to mild depression. This affects their relationship adversely. He starts to lose interest in Betty, becomes absorbed in himself, grumpy, withdrawn and painful to be around. He takes an antidepressant and their love is maintained. From the point of view of their relationship and his life, he has good reason to take the drug.[40]

Assuming the analogy between love drugs and antidepressants is as tight as the authors evidently believe it is, this might appear problematic for my account. For it might seem that John's taking antidepressants will predictably impair Betty's ability to ascertain with reasonable confidence that bioenhanced John treats her lovingly because he is appropriately disposed to do so, rather than for merely contingent reasons (e.g. because of the antidepressants in his system). If this is right, then supplementing psychotherapy with antidepressants in order to biochemically enhance John's moods will not expectably attenuate the heightened vulnerability to John's will to maltreat her that Betty experiences as a result of John's depression. Thus, consistency might require the following rather unintuitive conclusion: that, at least from the point of view of their relationship and love for each other, John and Betty have presumptively decisive reason to prefer psychotherapy *sans* antidepressants to psychotherapy *plus* antidepressants.

However, the depression and infidelity cases are disanalogous in a significant respect, for Betty's confidence that John treats her lovingly because he is appropriately disposed to do so is never at any point imperilled. During the period of John's depression – the period in which he treats Betty poorly – his disposition is offline (so to speak), such that his poor treatment of her is unanchored by his disposition. Thus, Betty has no reason whatsoever to doubt that John's disposition to treat her lovingly is perfectly sufficient, knowing that, were it not paralysed by the depression, he would be moved to provide her with the good of his loving care robustly, just as he (presumably) always did (prior to the onset of depression). By contrast, since Harry's disposition was never offline in the infidelity case, Karen, unlike Betty, has perfectly good reason to doubt that he is appropriately and sufficiently well disposed to robustly refrain from hurting her, and that makes the fidelity case quite different. To put it another way, in the depression case, all that Betty requires is unblocking of John's disposition to provide her with love and care robustly, not convincing of its sufficiency (which she has never had reason to doubt). And so, the question of whether John's biochemical enhancement via antidepressants would expectably restore Betty's confidence in the sufficiency of his disposition (and thus attenuate her vulnerability to his will) is moot. In the infidelity case, by contrast, what Karen requires is not unblocking of Harry's disposition to robustly refrain from sleeping around (for

[39] Earp et al., 'Natural Selection, Childrearing, and the Ethics of Marriage (and Divorce)', 564.
[40] Savulescu and Sandberg, 'Neuroenhancement of Love and Marriage', 38.

his disposition was never offline at all), but restoration of her confidence in its sufficiency. Unlike in the depression case, then, the question of whether or not Harry's biochemical enhancement via fidelity drugs would expectably restore Karen's confidence in that respect (and the suggestion that it would not) remains very much live.[41]

7. Conclusion

I began this paper pondering the question: what is the end of moral enhancement? The argument presented here supposes that the answer to that question is attenuation of vulnerability. If that is so, then I believe we should not recommend supplementing conventional methods of morally enhancing sexual fidelity with fidelity drugs for the reasons given. As we shuffle into an ever-more technologically advanced future, no-one can rule out the possibility that advances in neuroscience will yield new biotechnologies capable of making philanderers more faithful; more capable of seeing why it matters that they are faithful; and perhaps even more capable of being faithful for the right reasons. If what has been argued here is compelling, however, it may be that, in the end, none of that really matters. At least, however successfully fidelity drugs might promote behavioural, epistemic and motivational improvement in philanderers – even to the point of making them 'more moral', gains in those respects won't matter if, ultimately, they do little to assuage the heightened vulnerability victims of sexuality infidelity experience. And surely we should care about the victims too.[42]

University of Leeds
R.J.Arrell@leeds.ac.uk.

[41] I am grateful to Andrew Komasinski for impressing upon me the need to deal with this objection.

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