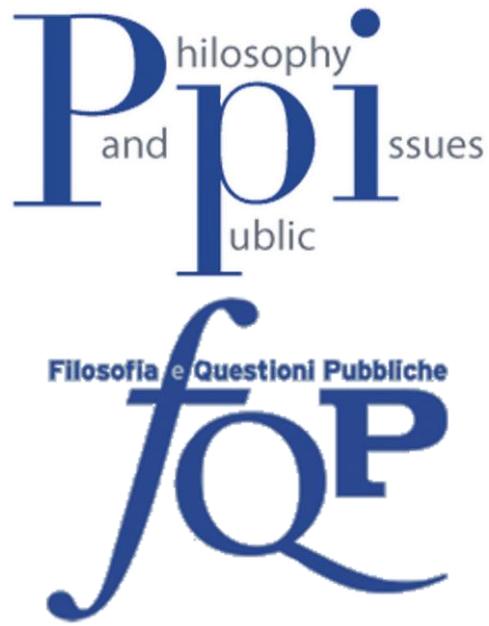


ENHANCING LOVE?



CHEMICAL LOVE: BIOENGINEERING EMOTIONS
IN CONTEMPORARY FICTION

BY

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Chemical Love: Bioengineering Emotions in Contemporary Fiction

Maria Aline Ferreira

Dopamine, serotonin, oxytocin.
Does knowing the chemistry change anything?
How long ago did she discover
that lovely was a chemical trick?
(Powers 2009, 176)

Introduction

The central purpose of this essay is to consider the role that certain drugs may play in romantic relationships, theorized in Earp and Savulescu's book *Love is the Drug: The Chemical Future of Our Relationships* (2020) and others, through the lens of selected fictional examples. The texts were chosen as representative instances of narratives that dramatize and problematize some of the issues raised by the use of drugs to improve or strengthen the romantic bonds between people, or, on the contrary, to help loosen those links. They go a long way towards suggesting that the characters' conviction that the drug they are supposedly taking is having an effect on the strength of their feelings for another person is largely an illusion, since it is revealed later that some of them have been given

placebos. Would a similar effect be possible and desirable in real life conditions? After all, if a placebo could work just as well as the real drug it would be a great advantage. This is a question which, prompted by the texts, is worth pondering.

These narratives also function as cautionary tales, calling attention to the potential dangers and pitfalls of prescribing drugs towards improving relationships, drugs whose effect may be largely deceptive (even more so in the case of placebos) and which will mostly profit the big biotech companies. In this sense the texts complexify Earp and Savulescu's main argument that selected drugs, administered and taken under appropriate supervision, may benefit certain individuals and improve particular bonds, either by allowing a renewal of links and attachments that may be in need of strengthening or, by facilitating the relaxation of those bonds and giving someone who feels trapped in a harmful relationship a way out. On the other hand, even if it is only as a placebo-induced effect, their influence on people's behaviour does need to be given serious consideration, as these tales emphasize.

One of the crucial questions that should be asked in the context of a couple's use of MDMA, nasal oxytocin or other synthetic drugs to boost their pair-bond is whether without it one or both individuals would not eventually break away, having ceased to love the other. Is it morally acceptable or desirable to induce an outcome that would have been different without pharmacological intervention? What is genuine love and how far can it be forced? Might each member of the couple not feel that the other's love is inauthentic, since it needs to be enhanced with drugs? These are amongst the pivotal issues fictionalized in the narratives, issues also central to Earp and Savulescu's argument. By placing the fictional narratives in critical dialogue with *Love Is the Drug*, our analysis of the shared thematic concerns will shed light on these topical and complex questions by suggesting potential scenarios in which these

concerns are played out with outcomes that can feed into clinical practice.

The essay will first assume thorough familiarity with the main arguments in *Love Is the Drug* and related works and will focus on representative fictional narratives which, in engaging with similar topics, take Earp and Savulescu's discussion further, by dramatizing possible results of the use of such drugs and thus highlighting the potential risks and benefits. The fictional and the theoretical texts shed light on one another and their study will fuel profitable debates about the most effective use of so-called love drugs.

Section I of the article briefly recapitulates the major concerns of Earp and Savulescu and related theorists. The following Section II turns to the first of the fictional works, Lucy Prebble's play *The Effect* (2012), and Section III goes on to examine Mike Uden's novel *Chemical Attraction* (2014), with Section IV being devoted to another novel, Margaret Atwood's *The Heart Goes Last* (2015). This leads to Section V, on the pathologization of society. The final section offers some concluding remarks.

I

Chemical Love and Clinical Trials

What if romance could be induced with pills or potions? That is the question driving the narrative in Lucy Prebble's play *The Effect* (2012), Mike Uden's novel *Chemical Attraction* (2014) and Margaret Atwood's novel *The Heart Goes Last* (2015).¹ The first two revolve

¹ One of the earliest examples of neuropharmacological fiction is probably Aldous Huxley's *Brave New World* (1932), which depicts a psychopharmacological society that aims to control people, not only through a

around the effect of testing new antidepressant drugs on healthy volunteers in clinical trials. It is suggested that some chemicals, such as oxytocin and vasopressin, may indeed have contributed to an unexpectedly high rate of seemingly incompatible volunteers developing romantic attachments. The third invokes a surgical procedure that causes the individual to fall in love with the first person they see after emerging from the anaesthetic. All three can profitably be read as engaged in a critical dialogue with Earp and Savulescu (2020).² We shall therefore turn to a brief overview of their work and that of related theorists.

The hypothetical implications of those fictional premises are not as conjectural as might be thought, since drugs that can encourage the onset of romantic attachments, such as alcohol,³ have existed for a long time, while MDMA and psilocybin, when properly used, could significantly improve people's lives and relationships.⁴ Other drugs, however, such as some anti-

eugenist programme of ectogestation in the laboratory but also by supplying a free drug called soma, effectively managing citizens' behaviour to suit the purposes of the governing body: consumerism and stability. Meaningfully, the initial, working title for Earp and Savulescu's book was, after all, *Brave New Drug* (2020, 13). Bennett also references Huxley (1932) when he writes about our "brave, new psychopharmacological age" (2019a, 146).

² Indeed Earp and Savulescu (2020, 53) muse about writing another book exploring "why love potions and anti-love potions have been such powerful and enduring tropes in fiction."

³ See Earp and Savulescu (2020, 7; 62).

⁴ See Earp and Savulescu (2020, 8). They believe that "perhaps the biggest area of research right now is on chemicals like MDMA (the key ingredient in the street drug ecstasy), lysergic acid diethylamide (LSD or acid), or psilocybin (from so-called magic mushrooms) being used as adjuncts to psychotherapy" (Earp and Savulescu 2020b, 6).

depressants,⁵ can have the opposite effect and dampen the enthusiasm of romance. While Earp and Savulescu caution against over-reliance on allegedly love-enhancing drugs such as oxytocin and testosterone, they argue that “given the right combination of other mental, biological, and social factors” (2020, 64) they could have that effect.⁶ They contend (2020b, 3) that “we should study the impact of these drugs on relationships more systematically, so that we can aim to avoid whatever harms they might be bringing to our love lives, while also exploring any potential benefits.”

Addressing contemporary reliance on pharmacology to modify and enhance our feelings and emotions, Rose (2003, 46) investigates how we have become “neurochemical selves,” shaped by the belief that our mental states are mostly caused by a chemical imbalance in the brain, living in “psychopharmacological societies,” where the “modification of thought, mood and conduct by pharmacological means has become more or less routine” and where “human subjective capacities have come to be routinely reshaped by psychiatric drugs.”⁷ In related vein Bennett (2019a, 3)⁸

⁵ See Earp and Savulescu (2020, 60). Discussing the effects of selective serotonin reuptake inhibitors (SSRIs), which are often employed to treat depression, Earp and Savulescu (2020b, 6) caution that “one and the same chemical substance might work as a pro-love drug or an anti-love drug depending on the couple, their dynamic, their circumstances, what they are dealing with, and their psychological profiles [...] Importantly, however, it also depends on how the couple consciously engages with, and responds to, the various effects of the drug on their thoughts, fantasies, motivations, and emotions.”

⁶ Earp and Savulescu (2020b, 6), also mention other drugs that have “understudied effects, both positive and negative, on sexual desire, attraction, and/or attachment include methylphenidate (commonly marketed as Ritalin), hormonal birth control, the hair-loss drug finasteride, certain blood pressure medications, and so-called recreational drugs like cocaine and alcohol.”

⁷ See also Healy (2002).

⁸ See Bennett (2019a, 2019b) for an analysis of some representative films.

analyses how “modern psychopharmacology’s recent proliferation of a vast arsenal of new psychotropic medications has pervasively reshaped the lived experience of modern life [...] perhaps even transforming what it ultimately means to be human in the modern world.” Indeed, he argues that in this new psychopharmacological age human identities are increasingly shaped by the pills we take.

Prebble (2012) and Uden (2014) grapple with the question of human identity in a psychopharmacological era.⁹ Are we still “us” if what we are feeling is somehow modified by the drugs circulating in our body? Can we trust those feelings and emotions? Will we revert to being the person we were before taking certain medications? Who is the real “me” then? If we prefer the “me” created by the pills should we carry on taking them for as long as we wish? Is that ethical and fair when so many people do not have access to the same treatments or conversely refuse to take them in order to remain “true” to their original, unenhanced body’s chemistry? The borders between these two versions of the same person are becoming increasingly porous and diluted. What if the façade we choose to present to the world can be generated by selected drugs and medication, so that the effort to show a certain version of ourselves to society would no longer be needed since with recourse to drugs we would become that person?

⁹ Bennett (2019, 29) explores how modern psychopharmacology can radically alter “human identities at a fundamental neurochemical level,” identities that are “increasingly determined, both for better and for worse, by simple pills” (*ibid.*, 30), indeed “pharmacologically fabricated” (*ibid.*, 141). According to Rose (2003, 57), in turn, “Psychiatric drugs today are conceived, designed, and disseminated in the search for bio-value. But they are entangled with certain conceptions of what humans are or should be—that is to say, specific norms, values, judgments internalized in the very idea of these drugs. An ethics is engineered into the molecular make up of these drugs, and the drugs themselves embody and incite particular forms of life in which the ‘real me’ is both ‘natural’ and to be produced” (emphasis mine).

According to the psychiatrists Lewis, Amini and Lannon (2007, viii), the “body’s physiology ensures that relationships determine and fix our identities.” What if the “biological reality of romance” could be induced with pills? In Prebble’s and Uden’s texts the plot involves clinical trials for a new anti-depressant drug and the effects it may have on the potential development of romance between two volunteers in each book, who in both cases become a couple. The crucial question they wrestle with as they gradually fall in love is whether their feelings are spontaneous or generated by the medication they may or may not be taking, since nobody knows who is receiving the drug or a placebo. How can our feelings be trusted if they may be the result of neurochemicals in our brains selectively stimulating certain neurotransmitters? What is our “true” self anyway? Is it not always a complex blend of all the legal cognitive and mood enhancers many people ingest on a daily basis such as coffee, wine and other spirits, or engaging in mood-elevating activities such as exercise? Would adding another synthetically produced chemical to the mix be so different? If people can feel better for taking that chemical, provided there are no significant side-effects, and potentially be better to others, also making them happier, then it may *prima facie* be acceptable.

Savulescu and Sandberg (2008, 37) argue that there are “many good reasons to take love drugs” to “enhance the quality of love” (*ibid.*, 42). They analyse the arguments for and against the “neuroenhancement of love” (*ibid.*, 31), consisting of the “biological manipulation of lust, attraction and attachment” and argue that “biological interventions offer an important adjunct to psychosocial interventions.” They repeatedly stress (*ibid.*, 39-40) that “[b]iological interventions can *simulate or produce* the phases of the evolution of a loving relationship: lust, attraction and attachment. They can increase the probability of a loving relationship occurring but they cannot by themselves cause love” (emphasis mine).

These reflections, including the potential for a drug to simulate or mimic the physical and psychological effects and symptoms of love are dramatized and complexified in Prebble (2012), Uden (2014) and Atwood (2015), which are also representative instances of what Roxburgh (2019, 21) calls “pharmacological fiction.” All three texts caution against the pathologization of love, by medicalizing and thus chemically interfering in situations that would have otherwise evolved in different directions, making it morally problematic to prescribe “love” drugs, even if the intention is clearly to help.¹⁰

II

A “Viagra for the heart?” (*The Effect*, 46)

Lucy Prebble’s play *The Effect* (2012) is a chemical drama revolving around a clinical trial of a new anti-depressant drug, focusing on the evolving romantic relationship between the two protagonists, Connie Hall, a psychology student and the only woman in the trial,¹¹ and Tristan Frey, who has already taken part in other drug trials.

Prebble got the idea for the play when she heard about a drug trial at Northwick Park Hospital conducted by Parexel, a firm that runs clinical trials for pharmaceutical companies.¹² As Miriam Gillinson observes in the Introduction to *The Effect*, Prebble had

¹⁰ See also Nyholm (2015a-b).

¹¹ Dr James specifically remarks on the fact Connie is the only woman. In Uden (2014, 25) Lily mentions having read that in clinical trials “safety tests were generally only done on men” (25) and only after that were they performed on men and women.

¹² It was the first human trial of a drug, TGN1412, that had an effect on the immune system. The six men who received the drug became very sick and had to be taken to intensive care, remaining in hospital for weeks.

also been reading about anti-depressants and the “effect of love, both of which raise the levels of dopamine in the body,” thus begging the question whether or to what extent love and depression are simply chemical events. The drug given to the volunteers in the clinical trial is a brand new anti-depressant, designed to “increase levels of dopamine” (Prebble 2012, 22), as one of the doctors in charge of the experiment, Dr Lorna James, explains to Connie, who develops romantic feelings for Tristan, which are reciprocated. Here we encounter a problem which would not occur in a real-life situation: should Dr James be divulging information about the effects of dopamine to one of the trial’s participants? Is it ethical? Clearly there has been a breach of rules that may precipitate an undesired outcome.

Connie and Tristan wonder whether what they feel is “real” or just the result of a chemical reaction. Having heard by accident from Dr James that Tristan is on a placebo, Connie fears that what they are feeling might fade, or what is even “worse, for one of us and not the other” (*ibid.*, 68). While Tristan believes he can tell the “difference between who I am and a side effect” Connie is sceptical and considers any attraction they may feel as at least in part a “result of the trial,” as a “chemical reaction” (*ibid.*, 33). Tristan is shocked at this view that he only likes her because he is “high or something” but Connie retorts that “we *are* our bodies, our bodies are us” (*ibid.*, 34; emphasis in the original).

Dr James and Dr Toby Sealey, her boss and ex-boyfriend, conduct many conversations about the trial: the former, who suffers from bouts of depression, is dubious about chemical treatments, whereas Dr Sealey believes in the potential of psychopharmacology. She tells him of the reported effects, which include “elevated mood [...] increased energy levels” as well as “damped amygdala activity” and “strong activity in the dopaminergic pathways and the reward centres of the brain in

general” which correlates with a strong “anti-depressant effect” (*ibid.*, 43). However, she introduces a note of caution, suggesting that the anti-depressant effect may have nothing to do with the drug, since according to her information one of them is receiving a placebo, and she reminds Dr Sealey that “you’re seeing what you want to see” (*ibid.*, 43), presumably with a view to profiting from selling the new pill. It turns out that the scans they are looking at belong to Connie and Tristan, whose brains exhibit the signs of increased activity consonant with their being in love. The question is whether these signs are caused by the drug or by their romantic attachment, a moot point they cannot agree on. As Dr James remarks: “You think because they feel all the things one would associate with infatuation they are just [...] assuming that’s what they are” (*ibid.*, 45), to which Sealey agrees, stressing that “assuming” is a crucial notion. As he states: “The body responds a certain way to what it’s being given, they can’t sleep, they can’t eat, they’re in a constant state of neural excitement ever since they met, what’s the brain going to conclude?”, so that the body not only “mistakes” it for love, “it creates it [...] [t]o make sense of the response.” Dr James is unimpressed and taunts him: “So what? You’re thinking you’ve discovered a Viagra for the heart?” (*ibid.*, 46). Dr Sealey in turn observes that while cannabis “increases susceptibility to schizophrenia,” he believes a “chemical vulnerability, to something more positive” can be created. After all, as he further states: “Medical science has extended everyone’s lives without taking any responsibility for us having to be married longer. We could do with a bit of help.”

Dr Sealey points out that maybe the reason the other trial subjects do not show such strong (potential) effects of the drug is that since they are heterosexual men, they do not have an adequate target for their feelings. Dr James eventually reveals that Tristan, “number seven,” is on a placebo, which proves that his symptoms are actually due to his developing a romantic attachment and not

to the drug. Dr Sealey forcefully argues that strong feelings can be instilled if they are targeted towards something that looks appropriate. He then gives the example of ducklings that can be made to “follow a kettle believing it’s their mother for years” (*ibid.*, 45) according to an experiment conducted at Exeter.

As it turns out, Rauschen Pharmaceuticals, the drug company in charge of the trial, and Dr Sealey were actually misleading Dr James as to who was on a placebo. She was effectively being studied for physician bias, as the doctor conducting the experiment and believing she knew who was getting the real drug or the placebo.¹³ As in the Northwick Park Hospital trial conducted by Parexel, where several volunteers needed hospitalization, Tristan suffers adverse side-effects from the drug and needs hospital treatment. Since Connie had been told that he was on a placebo she transfers her own pill, presumably the real drug, into his mouth, probably intending him to be on a more even keel with her in terms of the romantic effects produced by the pill. In effect, he must have swallowed double the dosage of what was already the highest dose of the new pill at the end of the trial and he starts seizing and bleeding, needing hospitalization. Connie and Tristan go on to live together at the end of the trial even though Tristan has lost his memory due to the drug overdose he sustained.

Prebble’s *The Effect* crucially engages with the idea recurrently articulated by Connie that we are “neurochemical selves,” to borrow Rose’s expression (2003, 46). After all, the notion that depression is mainly caused by an “abnormal amount of chemical -- in the brain or anything” (Prebble 2012, 5) has been around for a while now, having become common currency as voiced by Connie. This is, indeed, a concept that is addressed throughout the

¹³ In most cases the medical team conducting the trial will be unaware of who is getting the real pill or the placebo so as not to be influenced by that knowledge when interpreting the results.

play, as Ven (2020, 127) contends: “Is such chemical balance the cause of depression or is depression the cause of such imbalance?” According to Rose (2003, 57), it appears that “individuals themselves are beginning to recode their moods and their ills in terms of the functioning of their brain chemicals, and to act upon themselves in the light of this belief.” As he observes (2003, 57), “If we are experiencing a ‘neurochemical reshaping of personhood,’ the social and ethical implications for the twenty first century will be profound. For these drugs are becoming central to the ways in which our conduct is determined to be problematic and governed, by others, and by ourselves to the continuous work of modulation of our capacities that is the life’s work of the contemporary biological citizen.”

These issues are also deeply entangled with a capitalist system within whose remit biotech and pharmaceutical companies operate, with profit often guiding business decisions. As Ven (2020, 127) notes, Connie and Tristan’s anxieties are “extensions of capitalist structures; the confusion of ‘real’ feelings with manufactured ones is possible only within the pharmaceutical testing chamber, a microcosm of the collaboration between psychiatry and capitalist forces.”

All of these questions are also centrally at issue in Uden’s *Chemical Attraction*, which can be seen as a companion text to Prebble’s *The Effect* and another representative instance of neuropharmacological fiction.

III

A “love drug” (*Chemical Attraction*, 186)

As in Prebble (2012,) the protagonists of Uden (2014) sign up for a clinical trial conducted by a company called MediSee which

describes itself as representing “ethically sound drug companies” (*ibid.*, 15). MediSee is enlisting volunteers, at one of London’s top teaching hospitals, to trial a new drug called Pheroxosol, which they are touting as the “first anti-depressant with absolutely no side effects” (*ibid.*, 19), at least that is the hope.

When the drug was trialled on rodents it was found that they appeared to “fight less and copulate more” (*ibid.*, 19). The scientist behind the development of the drug, Dr Amraj, shared this perception with the CEO of Calmerceutical, William Wyles, who grew interested in the idea after an initial sceptical reaction. After all, as a businessman, anti-depressants “made good business sense” while “love potions” (*ibid.*, 19) did not. According to Dr Amraj the tests showed “increased sexual activity” (*ibid.*, 20; emphasis in the original) in the rats and it “reduced their number of sexual partners” (emphasis in the original). This effect was attributed to the oxytocin¹⁴ in the drug, which also contains pheromones¹⁵ and dopamine. While oxytocin, produced by pregnant women to help them bond with their baby and sleep better, encourages intimacy, pheromones are associated with sexual attraction and dopamine is the “reward” (*ibid.*, 20) drug, abundantly produced during sex, as explained by Dr Amraj. The tentative conclusion that Wyles draws is that the new anti-depressant could “improve relationships,” an inference Dr Amraj concurs with, suggesting it could indeed stimulate the “dating, the getting together *and* the staying together” (*ibid.*, 21; emphasis in the original). As the latter goes on to observe, pheromones also have an interesting evolutionary purpose, since they seem to promote attraction between people who are very

¹⁴ Despite its role in promoting intimacy between mothers and newborn babies, Earp and Savulescu (2020, 114) warn against its being seen as a panacea for romantic relationships and its use as a potential love drug, since it will “likely only be so for some people under some conditions.”

¹⁵ Savulescu and Sandberg (2008, 35-36) also refer to the role of pheromones in potentially promoting lust and attraction.

different, thus encouraging genetic diversity, and “mixed genes mean survival” (*ibid.*, 21).

Dr Amraj tentatively muses on the impact of the new drug if the effect seen on rodents is replicated on humans, if it works as a “sort of fall-in-love drug,” as a “love stimulant” (*ibid.*, 31). While he worries that if the new drug is indeed effective it might be “unethical” to be “playing with people’s emotions,” Wyles considers that they are producing “happy pills” (*ibid.*, 31), calling it a “nasal Prozac” (*ibid.*, 30) and so does not see any reason for concern. Dr Amraj even speculates it might promote fidelity and thus it would be a “monogamy pill” (*ibid.*, 32).

When discussing with Dr Taylor, the physician in charge of the trial, possible effects of the drug on the volunteers, including on the potential development of romantic relationships,¹⁶ Dr Amraj has to frame this possibility in scientific terms, observing that “if emotions have physiological effects on our bodies – increased heartbeat, hot flushes, breathlessness – why not the reverse; physics having emotional effects?” (*ibid.*, 76) He also mentions the oxytocin, the dopamine, the pheromones and for good measure even alludes to androstadienones (76).¹⁷ Dr Taylor is then more

¹⁶ Significantly, Earp and Savulescu 2020b, 5, “call for a comprehensive shift in scientific research norms toward a more relational focus, whereby effects on relationships should be more regularly included among the primary outcome measures in clinical trials and other studies.”

¹⁷ In molecular biologist Joan Slonczewski’s *Brain Plague* (2000), a novel whose action unfolds on a different planet in the future, love is described in terms of the neurochemicals in the brain. Thus, a character comments that “Adrenaline means more than fear [...] And (divine) love is more than adrenaline and dopamine” (2000, 242) to which another character retorts: “Certainly. There’s phenylethylamine and oxytocin. Love is a most complex and difficult problem” (*ibid.*, 242). Dopamine is described as the “central molecule of reward,” entering the “neurons to create pleasure. Everything humans do – loving, dying, killing

receptive to the idea of having a closer look at the behaviour of the volunteers in terms of the potential development of romantic attachments.

The protagonists of the tale are Lily and Ben. Lily teaches English as a Foreign Language, is quiet and fond of books while Ben, who works in advertising, has just lost his job and is looking for a way to make some money. He enjoys drinking and often gets intoxicated. Lily and Ben do not appear to have much in common, so much so that Lily thinks of him as an “idiot” (*ibid.*, 52). It is then all the more surprising that they fall in love during the trial and even go on to live happily together for a while, a state of affairs Lily thinks may be linked to the fact that they are still both taking the medication. Ben hardly ever drinks any more, exercises a lot and feels like a totally different person after the trial. Lily even muses she had never known “anyone change as much as him before” (*ibid.*, 103). Ben, for his part, considers the experience at MediSee “truly life-changing” and he even cogitates that he’s “somehow developing a female brain” (*ibid.*, 108), as he feels that he is starting to understand Lily. Since all the volunteers have continued to take the drug after the trial is over, Ben attributes his change to the pills, though he never questions the genuineness of his love for Lily until he comes across a piece of news online that suggests the drug they are taking will be marketed as a love pill. After reading several entries about CalmerCeutical, the company producing the new drug, suggesting it might promote long-lasting

– they do for dopamine” (*ibid.*, 34). *Brain Plague* considers the possibility of significantly enhancing the brain’s capacities by means of intelligent, sentient microbes that improve the subject’s creativity but can also tinker in a dangerous way with the dopamine receptors. As in other fictional examples considered in this essay, in Slonczewski’s novel a character, Chrys, an artist who is having creativity issues and financial problems, decides to enlist in an experimental medical trial that investigates the role of these intelligent microorganisms in the brain.

romantic relationships, Ben starts wondering whether his love for Lily is just an effect of the drug and whether his feelings are real. One of the articles about the trial stated that most of the participants “*showed a greater predisposition towards the initiation and maintenance of romantic partnerships*” (*ibid.*, 129; italics in the original). *The Financial Times*, in turn, wrote that CalmerCeutical are looking into the possibility that their new drug “*could encourage greater stability in human relationships – particularly those of a romantic nature*” (*ibid.*, 129; italics in the original) while *New Scientist* observed that the drug “*could encourage more monogamous relationships*” (*ibid.*, 129; italics in the original) probably due to the oxytocin and dopamine in the pill. Inevitably Ben muses whether the changes he’s been experiencing are a direct result of the experimental drug and decides to cease taking it.

In the meantime Lily discovers she is pregnant¹⁸ and also stops the medication, so both Ben and Lily discontinue taking the pill without telling each other or sharing their motives for doing so. After a few days off the medication Ben starts noticing that he does not feel so close to Lily and forgets to include her in some of his plans, inevitably causing him to wonder if he is “changing back” (*ibid.*, 145). He decides to talk to Dr Taylor, sharing with him his doubts and questioning if he is “just a walking side effect” (*ibid.*, 152). Lily, for her part, realizes she is “cooling off” (*ibid.*, 173) a bit towards Ben, who in turn wonders about the point of “carrying on a relationship that relies on chemicals” (*ibid.*, 174). Lily goes even further and muses that if she decides to have the baby and they are still together, then what kind of future would the kid have in a

¹⁸ Hearing about Lily’s pregnancy, Wyles is very excited with the business prospect it represents and fantasizes about the headlines around Lily and Ben: “*Love Drug Pair To Have Baby*” (*ibid.*, 211; italics in the original).

family “held together by chemicals” (*ibid.*, 198)? On the other hand, Ben regards Pheroxosol as a “back-up plan – for when things go wrong” (*ibid.*, 198), a sort of make-up drug, while Lily emphatically replies that she wants to “love someone because I *love* them, not because of some [...] pharmacist” (*ibid.*, 199), words that in many ways resonate with and almost summarize some of the main arguments in Earp and Savulescu (2020). Indeed, the question of the authenticity of their feelings is a central concern for both Lily and Ben, as is also the case with Connie and Tristan in Prebble’s *The Effect*.

Savulescu and Sandberg (2008, 39) also address recurring concerns “over whether enhancements threaten authenticity [...] Would chemical enhancement of relations render love inauthentic?” In words that apply to and shed light on the potential nature of the relationships initiated in Prebble (2012) and Uden (2014), Savulescu and Sandberg (2008, 40) point out that it is “important to distinguish between the use of love potions to create new love and to foster existing love. The use of drugs to instill a new love is more likely to create inauthentic love, since the causal reasons for the love may lie in the drug (and external events surrounding the situation), rather than the particular person loved. This would not be the case in an established loving relationship that is losing its momentum.”¹⁹ Earp, Sandberg and Savulescu (2015, 331) observe that “[i]f the administration of certain ‘love drugs’ turns out to be effective in promoting states of mind and behavioral dispositions that are conducive to a healthy relationship, then couples may simply have an additional tool at hand to help them pursue their overriding interpersonal aims.” This is precisely what Ben is considering doing by potentially taking the new trial drug when their relationship is faltering.

¹⁹ See also Parens (2009, 184).

As Earp, Sandberg and Savulescu (2015, 324) further argue, “under certain types of conditions” pharmaceuticals (and other emerging technologies) could be used to “enhance” or ‘diminish’ our love-related drives, emotions, and attachments.” This use, however, could lead to the “medicalization” of human love and heartache,” an objection they proceed to analyse, suggesting that it is mostly the “*pharmaceuticalization*” (*ibid.*, 325), a “related but distinct phenomenon,” of dealing with relationship issues that is mostly at the focus of concerns.²⁰ In this context, they observe, with respect to romantic relationships, that “treatment [paradigms] should hinge on considerations of harm and well-being, rather than on definitions of disease” (*ibid.*, 329). As they argue, medicalization can be “either good or bad” (*ibid.*, 331) depending on a number of factors, including the people involved and the social context, as *The Effect* and *Chemical Attraction* powerfully dramatize, problematizing the positive outcomes of the use of such drugs. Indeed, they can also be used to exploit and hypothetically enslave people psychologically to others who have the necessary power and financial means. Aspects of this sexual enslavement are dramatized in Margaret Atwood’s *The Heart Goes Last* (2015).

IV

A “magic love potion” (Margaret Atwood, *The Heart Goes Last*, 256)

Love potions of various sorts have featured in many narratives as individuals attempt to manipulate other people’s emotions and in particular when they wish someone to fall in love with them to the exclusion of all others. Many fictional recipes have been tried

²⁰ In a subsequent article, Earp, Sandberg and Savulescu (2016, 759) emphasize the need for “careful regulation” of so-called love drugs.

and found either effective or useless.²¹ One of the most notorious is the juice of a flower named ‘love-in-idleness’ (wild pansy or *Viola tricola*) in Shakespeare’s *A Midsummer Night’s Dream*, which Oberon uses on the sleeping Titania, who upon waking up falls madly in love with the first creature she sees who happens to be Bottom with a donkey head. In turn, Robin, a fairy, drops the potion on the eyes of Lysander and later Demetrius who are asleep, giving rise to chaotic turmoil. In the end all the confusion is satisfactorily settled. The play is, after all, a comedy.

It is not fortuitous that Atwood (2015) is peppered with allusions to *A Midsummer Night’s Dream*, since one of its recurring thematic concerns is the question of free will and the related topic of what true love is if the person in love has been deprived of choice by a biomedical intervention not unrelated to a love potion. Indeed, it is no coincidence that one of the three epigraphs in the

²¹ With echoes of Huxley’s *Brave New World*, Brian Stableford’s story “Sexual Chemistry,” set in 2036, tells the story of Giovanni Casanova, who develops a kind of love potion, a “secretion,” an “aphrodisiac technology” that would “signal a delicate expression of erotic interest with no offense to be taken if there was no response” (2013, 32). This secretion leads indeed to a generalized happiness in the population, including Casanova and his wife. They “favoured one another constantly with the most delicate psychochemical strokings, and learned to play the most beautiful duets with all the ingenious hormonal instruments of Giovanni’s invention, but they also had a special feeling for one another – and eventually for their children – which went beyond mere chemistry and physiology: an affection which was entirely a triumph of the will. There was a treasure which, they both believed, could never have come out of one of Giovanni’s test tubes” (*ibid.*, 33). This version of a chemically induced utopia could almost be said to correspond to Earp and Savulescu’s (2020) vision of a drug that would enhance relationships while those involved also worked on keeping those attachments harmonious and fulfilling. See also Lem’s *The Futurological Congress* (2017 [1971]), where in a future society the government, much as in Huxley (2007 [1932]), uses drugs to control and tame citizens.

novel is from Shakespeare's play²² and one of the themes in both narratives is that of love potions, or more precisely in *The Heart Goes Last*, neurosurgery that will make someone imprint on the person who commissioned the procedure (or the first person they lay eyes on).²³ If a technology was invented that enabled people to be similarly imprinted to love someone specific, it would be much more powerful than any love pill or potion.²⁴ That is exactly what Atwood (2015) envisages, where this technique is directed to make people (usually women) fall in love with their lovers or husbands.²⁵

Atwood's narrative revolves around a couple, Charmaine and Stan, who have lost their jobs and are literally living in their car, in the context of a financial crisis similar to that of 2008. Charmaine sees a job advertisement for a social experiment called Positron Project, a for-profit prison, in the new gated community of Consilience, which includes spending a month in a comfortable house and the next in a prison, while another couple, their "Alternates," live in their house during the month they spend in

²² The extract included in the epigraph is the following:

"Lovers and madmen have such seething brains,
Such shaping fantasies, that apprehend
More than cool reason ever comprehends."

²³ In Jessica Khoury's *Vitro* (2014), a Young Adult novel, "Vitros," genetically engineered embryos grown in artificial wombs, are kept in a kind of suspended animation until the scientists that created them deem it time for them to be wakened up. Apart from their enhanced physical capacities, they carry a chip that contains a type of imprint technology, which basically means that the newly awakened Vitro, having been kept asleep till s/he is required, usually in late adolescence, will "imprint" on the first person s/he sees, following their every order, effectively like a slave.

²⁴ It is no coincidence that another of the Epigraphs is from Ovid's "Pygmalion and Galatea" (Book X, *Metamorphoses*).

²⁵ Similar to the plot in Levin 2011 [1972].

prison and then they switch again, supposedly without ever meeting.

The technology used to make people fall in love with a certain person is a type of brain surgery, based on work to erase “painful memories, in vets, child-abuse survivors, and so forth” (Atwood 2015, 262).²⁶ Before further details of this scientific advance are revealed one of the employees at Positron wonders if the technique involves “pheromones” or if it is a “new oxytocin-Viagara [sic] pill,” in which case the effect would not last long. According to Ed, the CEO and president of the Positron Project, not only can scientists “pinpoint various fears and negative associations in the brain and then excise them, but they can also wipe out your previous love object and imprint you with a different one” (Atwood 2015, 262). Although the subjects of the operation are effectively deprived of free will they do not mind, since their memories have been erased and their previous romantic attachments have been “nullified” (*ibid.*, 263). They are effectively “sex slaves created by neurosurgery” (*ibid.*, 285).

Charmaine learns that Ed was contemplating taking her to Las Vegas to have the procedure done so that she would imprint on him and forget her love for Stan. She is duly horrified and comments: “This is like one of those love potions in the old fairy-

²⁶ In Lauren Oliver’s Young Adult novel *Delirium* (2011) the premise is the opposite to that dramatized in Atwood (2015). In the novel’s dystopian future love is regarded as a disease that needs to be cured so that people can lead a stable and predictable existence. This is achieved through a brain operation that is performed on everybody when they turn eighteen. The state then matches people and there is no room for choice. Yet another instance of imprinting for love occurs in Steven Spielberg’s film *AI Artificial Intelligence* (2001), where Monica goes through an imprinting process so that the “mecha” boy, David, an android, will love her unconditionally as his mother.

tale books [...] The kind where you get imprisoned by a toad prince. In those stories you always got the true love back at the end" (*ibid.*, 264). However, in the life Ed was planning for her, she will be "under some awful toad prince spell forever" (*ibid.*, 264). Charmaine further muses, blaming bodily chemistry for how people sometimes act: "It wasn't Stan's fault, it was the fault of chemistry. People said chemistry when they meant something else, such as personality, but she does mean chemistry. Smells, textures, flavours, secret ingredients. She sees a lot of chemistry in her work, she knows what it can do. *Chemistry can be like magic. It can be merciless*" (*ibid.*, 77; emphasis mine).

In a plot twist Charmaine wakes up from the operation (or so she believes) and imprints on Stan, who apparently ordered the operation. As in Prebble (2012) and Uden (2014), Charmaine ponders her situation and her "lingering doubt" (Atwood 2015, 294): "Does loving Stan really count if she can't help it? Is it right that the happiness of her married life should be due not to any special efforts on her part but to a brain operation she didn't even agree to have? No, it doesn't seem right. But it *feels* right. That's what she can't get over – how right it *feels*" (emphasis in the original). However, the language Charmaine uses is also often employed by people who feel they "*couldn't help it*" (*ibid.*, 302; emphasis in the original), being helplessly and hopelessly in love with someone.

In another narrative twist reminiscent of *The Effect* and *Chemical Attraction*, it turns out Charmaine did not have the operation after all, or at least that is what another character, Jocelyn, tells her, so that Charmaine no longer knows whether her feelings for Stan are an illusion created by her belief in the procedure, as a kind of placebo effect, or whether she really loved him anyway and the conviction that she had undergone neurosurgery just reinforced that feeling. Jocelyn reminds Charmaine of the freedom she now

enjoys, not being forced to do anything against her will: “Isn’t it better to do something because you’ve decided to? Rather than because you have to?” (*ibid.*, 306). Charmaine is doubtful, observing that love “isn’t like that. With love, you can’t stop yourself.”²⁷ Indeed, one of the major themes in the novel is precisely the question of what true love is, as in Prebble (2012) and Uden (2014).

A love pill that also promoted stable relationships and monogamy would no doubt be a resounding commercial success, reshaping society in unprecedented ways but also raising multiple ethical concerns, as already discussed. The marketing of new drugs, in particular, is key to big pharma’s success and market penetration, as Wyles, the CEO of Calmerceutical in Uden (2014) and Dr Sealey in Prebble (2012) understood so well. Indeed, as Ven (2020, 127) asserts, discussing Prebble (2012), the development of new drugs is often “tethered to capitalist exploitation.”²⁸ There is, indeed, an increasing pathologization of society and the market forces expanding to match the demand for chemical substances to address new diseases, often “created” to fit a new drug, thus encouraging drug companies to “sell us drugs we don’t need for diseases we don’t have” (Earp and Savulescu 2020, 171), as is the case in Christopher Herz’s *Pharmacology* (2011).²⁹

²⁷ The satirical angle taken on this technology is abundantly clear when during a tour of the facilities the group is shown a woman who, after having had the neurological procedure done, first looks upon waking up at a teddy bear, instead of her would-be lover, hopelessly and inexorably falling in love with it instead of the man who was paying to have that procedure done.

²⁸ In this context see also Angelaki (2019).

²⁹ This pathologization of society can also be seen in the use of selected drugs to enhance physical capacities in order to suit new and demanding lifestyles. This is the case in Dirk Wittenborn’s *Pharmakon* (2008), where a new drug, not yet

V

The Pathologization of Society

The medicalization³⁰ of what can by and large be described as feelings and perceptions that to a great extent fall within the normal range of human experiences is fictionally explored in Christopher Herz's *Pharmacology* (2011), whose narrative unfolds in the San Francisco of 1993, at the start of the Internet revolution. The protagonist, Sarah Striker, is being paid to conceive and develop "awareness campaigns" (Herz 2011, 110), mostly digital, that not only create the "symptoms" and behaviours that would fit a new "disease," but also generate the perceived need for a certain drug within a target population, before the actual drug hits the market. With the digital revolution and people spending long periods of time at the computer, their attention spans and ability to concentrate appear to be affected. Noticing this trend, biotech companies have developed Atendol, the medication to treat ADD – attention deficit disorder, whose symptoms will need to feature abundantly in the media and in particular on the internet, which was just beginning to reach a wide segment of the population, in particular younger people. As Sarah puts it, they are "creating the disease as well as the cure" (*ibid.*, 128). However, Sarah finds this creation of new "pathologies" to fit the demand for a certain innovative drug produced by biotech companies, to be despicable and she leaves her job.³¹ Earp, Sandberg and Savulescu (2015, 327) address a number of issues that overlap with Sarah's experience and worries in her new job, which involves the pathologization of

approved, dramatically enhances cognitive skills but has terrible side effects and is often fatal.

³⁰ For a related take on medicalization see Earp, Sandberg and Savulescu (2015).

³¹ See also Earp, Sandberg and Savulescu (2015, 326).

a “new” behavioural “disease” brought about by excessive time spent in front of digital devices.³²

Rose stresses the role and power of big pharmaceutical companies in shaping the perceived need for drug use and promoting it. As he points out, “Many of these large multinational conglomerates make a considerable proportion of their income from the marketing of psychiatric drugs, and their success, or failure, in attracting market share is key to maintaining the shareholder value of the company” (2003, 58), and as he pertinently observes: “Where Foucault analyzed biopolitics, we now must analyze bioeconomics and bioethics, for human capital is now to be understood in a rather literal sense – in terms of the new linkages between the politics, economics and ethics of life itself” (2003, 57).

Prebble (2012), Uden (2014) and Atwood (2015) similarly tackle the commodification of feelings, in particular love, managed and conditioned through the use of drugs marketed by powerful biotech companies focused on profit. Potential “love drugs” could thus come to be seen as addressing the perception of a need for medical intervention, as in Herz (2011), in an increasingly medicalized society, driven by the urge to pathologize and to treat every stronger emotion as “symptom”, no matter how normal it would have been considered until then.

Conclusion

The ambition to create substances that will promote well-being, both physical and psychological, as well as improve relationships, is as old as medicine. However, could these chemicals also change

³² Frances (2013, xix-xx) worries about the increasing and widespread “wholesale medicalization of normality.”

the individual's personality and, even more radically, their very identity so that enhancements are achieved at the cost of what could be perceived as a different self to the original one? Would that then erase the perception of authenticity, of "real" feelings experienced by the original ego and lead to existential doubts about who the "real" person is? Crucially, if the love someone feels towards another is induced by pills is it still "authentic"?

These and related vexed questions are explored in Earp and Savulescu (2020) and given fictional dramatization in the texts examined here, texts that add further analytical layers to their study. Indeed, one of the central questions these fictional narratives ask is linked to the problem of identity and consciousness: who is the "I" that thinks and feels under the potential influence of these drugs? Would this kind of emotional engineering be unethical? Who would control its application? Earp and Savulescu (2020, 12) argue that if it is feasible to "safely target the underlying neurochemistry that supports romantic attachment, using drugs or other brain-level technologies, then there is reason to think this could help some people who really need it." If that becomes a possibility then ethical limits need to be established, as well as "legal and policy structures." They defend the ethical and responsible use of "medical interventions as complements to social and political change, rather than as replacement" (2020, 185-186).

The limits of neuroscience and psychopharmacology are thoroughly tested in the fictional texts analysed here, which dramatize the potential impact on individuals and society of tinkering with the neurochemical underpinnings of the biology of love and attachment to shape relationships and bioengineer people's life decisions. Indeed, speculative bioethical fiction³³ and neuropsychopharmacological novels offer valuable templates that

³³ For further elaboration on this topic see Schick (2016).

as if in dialogue with Earp and Savulescu (2020) and related works flesh out some of the most important arguments and concerns addressed in that book, as thought experiments that usefully instantiate possible ramifications and consequences of the clinical use of “love drugs”.

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