Contradictory Stimulation

Renato Vieira dos Santos[1]

[1]UFLA - Universidade Federal de Lavras, DFI - Departamento de Física, CEP: 37200-000, Lavras, Minas Gerais, Brazil.,
renato.santos@dfi.ufla.br, econofisico@gmail.com

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Abstract

Motivated by the apparent (or evident?) chaotic state of affairs in the political life of contemporary inhabitants of planet Earth, I ventured to describe a possible psychological masses domination strategy called "contradictory stimulation". Assuming that there is the possibility of a genuine intention on the part of some families and powerful organizations in guiding humanity in the way of their interests, I point through mathematical models that contradictory stimulation can be effective in inducing a subservient mentality in the political citizens. Recognize the existence of artful stratagems of manipulation and "brainwashing" sharpens our critical sense and changes our world view. It is the first step in a reaction that try to ensure individual freedoms, if they are desirable.

Key words: Contradictory stimulation; Mass media; Manufacturing consent; Meta-capitalists; Individual freedom; Mathematical modeling.

1 Introduction

" ... when the state loses the bludgeon, when you can't control people by force, and when the voice of the people can be heard you have this problem — it may make people so curious and so arrogant that they don't have the humility to submit to a civil rule ..., and therefore you have to control what people think. And the standard way to do this is to resort to what in more honest days used to be called propaganda, manufacture of consent, creation of necessary illusion. Various ways of either marginalizing the public or reducing them to apathy in some fashion."

In Manufacturing Consent: Noam Chomsky and the Media, 1992 [1, 2]

"When you are dead, you do not know you are dead. It's only painful and difficult for others. The same applies when you are stupid."

Ricky Gervais

Imagine a hypothetical world where there are *innocent* people and *smart* people. What characterizes both groups is not the ephemeral nature of their current condition or status, but the evolutionary dynamics of their families throughout history.

Innocent people, in general, plan their lives in a reduced time scale. Some of them works in their jobs or manages their business to provide good living conditions for his family and, if all goes well, have a good retirement and eventually go to heaven to talk with the good Lord, if religious. The maximum possible success occurs when a supposed good education is guaranteed to their children, so that there is the possibility of maintaining the good standard of living and *iPhones* for all, perhaps for another generation. The other part of the innocent people, especially in developing countries, many of them with populist governments, hopes that the nanny state offer improvements in their living conditions through the abstract and illusory concession of rights without counterpart in duties. In the long run, most of the families of innocent people are like a random walk in one dimension: always go back to square one.

Meanwhile, a very little group of really smart people has a *without limits* time scale in which they plan their lives and that of their offspring. His desire is to maintain its extremely rare and privileged status and to establish full conditions for their families constitute long-lived *dynasties*. This is very important: this disciplined and costly planning enables them to *determine* the course of history. After all, they are smart and have the means of action for it: the *power*. The power to determine the history. But wait: they are not who you're thinking. They are *beyond* "little evil" capitalism. They do not like the *free market*. They prefer to *buy* governments. They are the *meta-capitalists* [3].

The meta-capitalists are noble families who several decades or centuries back in history have accumulated wealth and power. They have the power to kill (or the "power of the sword"), estates, banks, railroads, mines, prestige, etc., and are knowledgeable of the need to protect their business and not to be exposed, in the long run, to the uncomfortable oscillations of the free market. Advances in science and technology can render superfluous what once was valuable. The *freedom* to do business can jeopardize their power (when I think about it, I am inspired by Google, Apple, Facebook, Amazon, big actors who entered the scene recently). But as they are holders of the means of action, they will try to avoid this at any cost.

When this caricatural description of this hypothetical world is made with the naive intent to simplistically describe our real political world, some people react. They protest, some ironically, others, hysterically[1]: "this is *conspiracy theory*!", they say. This automatic response, which here we call *hysterical stubborn self-deception*, is considered by them as a perfect demonstration that the state of affairs described is false. Questions about it should not be done, think about such a possibility is ridiculous and who does it is crazy and deserves to be ridiculed, scorned, arrested or hospitalized. The uniformity with which such a reaction is obtained is frightening. After all, would not be auspicious for the eventual owners of the world, induce and maintain in his commanded the very same misleading perception? Knowing a little of the human nature and of its condition in this world, I think it is not an overly unrealistic exercise as-

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[1]I am using the term hysterical as referring to those who do not believe in what see, but only in what he says and repeats.

sume this state of things as *perfectly plausible*. And of course, I'm not alone:

> "It is perhaps the greatest danger of the systems of modern totalitarianism that they are so alarmingly up-to-date not only in physical and biological, but also in psychological technology. The methods of mass suggestion, of the release of the instincts of the human beast, of conditioning and thought control are developed to highest efficacy; just because modern totalitarianism is so terrifically scientific, it makes the absolutism of former periods appear a dilettantish and comparatively harmless makeshift." [4]

This is how Ludwig von Bertalanffy warned his readers, nearly half a century ago, to the apparent use of his major contribution to science (general systems theory [5]) for improper purposes.

The "hypothetical" reality described, according to my limited analysis capabilities, is consistent with the current international scene. We live in an era of many uncertainties, conflicts and widespread confusion and disinformation. We are bombarded with contradictory and paradoxical informations, since the criminalization of smoking with the subsequent decriminalization of marijuana, to the proposed legalization of abortion under the pretext of enforcing human rights. And these kinds of "paradoxical contradictions" (an emphatic intentional redundancy) are not presented as antagonistic proposals from interest groups competing for ideas. They are presented in a uniform manner as divine truth across conventional Western media, especially in developing countries and Europe, and to a larger extent, for now, in the United States of America.

It is one of the desires of an inquiring and critical mind to understand the processes of the world in which it is immersed. In this article I propose a *mathematical description* of a possible artful psychological trap, which can be used to induce this unfortunate current state of things in order to deceive the people, weakening them psychically to prevent his own recognition of the situation. Mathematical descriptions are generally useful in organizing ideas and concepts, and allows the achievement of new insights that would otherwise be very costly and even tragic (social experiments on a large scale or with the individual invariably result in genuine human tragedies [6, 7]). Assuming some hypotheses, we will see which logical conclusions follow. And the stronger assumption made in this paper is that the mentioned chaotic state of things is the result of an unfinished work of *social engineering* [8]. If this hypothesis work to shed some light to the endless paradoxes and absurdities today massively disseminated to the four corners, I will give myself partially satisfied, since the potential naked reality would be too cruel. If someone proposes a better argument, I am eager to meet it. I believe that the humanity is undergoing a *unconscious passive revolution* in which almost the whole people of the world even realize. Some unknowingly are clamoring for their slavery, perhaps in the name of equality or fraternity. Humanity seems to be going through a *tipping point*, meticulously articulated to satisfy certain interest groups.

Closing this introduction, it is curious to remember that some decades ago, someone seems to have explained the phenomenon of *hysterical stubborn self-deception*:

> " ⋯ in the big lie there is always a certain force of credibility; because the broad masses of a nation are always more easily corrupted in the deeper strata of their emotional nature than consciously or voluntarily; and thus in the primitive simplicity of their minds they more readily fall victims to the big lie than the small lie, since they themselves often tell small lies in little matters but would be ashamed to resort to large-scale falsehoods. It would never come into their heads to fabricate colossal untruths, and they would not believe that others could have the imprudence to distort the truth so infamously. Even though the facts which prove this to be so may be brought clearly to their minds, they will still doubt and waiver and will continue to think that there may be some other explanation. For the grossly imprudent lie always leaves traces behind it, even after it has been nailed down, a fact which is known to all expert liars in this world and to all who conspire together in the art of lying."

These are words of Adolf Hitler, in *Mein Kampf*, chapter 10 [9].

2 Model

Consider a variable x representing the emotional state of an individual at time t. $x > 0$ is a positive state that can be interpreted as a measure of psychological well being and, similarly, $x < 0$ represents a depressive psychological state. If we assume that any disturbance in the state of emotional equilibrium of a (psychologically balanced[2]) individual tends to decrease with time, the simplest model is

$$\frac{dx}{dt} = -mx + b = a(x) = -\frac{dV(x)}{dx}. \tag{1}$$

Eq. (1) defines the *drift* and *potential* functions, $a(x)$ and $V(x)$, respectively. m is a "inertia" term which determines the time relaxation of the state x, and b characterizes a nonzero state of equilibrium. Any initial emotional state $x(0) = x_0$ different from the steady state $x(t \to \infty) = x^* = b/m$ relaxes to it exponentially. This equilibrium state x^* is given by the minimum of the potential $V(x) = -\int a(x)dx$. The parameter b is a measure of how good (or bad, if $b < 0$) is your emotional state of equilibrium and m is a measure of how fast the state of equilibrium is re-established if eventually disturbed. These two parameters (m and b) are associated with the intrinsic mentality of the individual. They are constants inherent to their personality, independent in principle, but not immune, to external influences. Our goal now is to add a term in Eq. (1) that characterizes the external influences *on* the individual. A *influence function* to model this external influences must have the following properties:

1. The intensity of the external influence on the individual should be approximately proportional to the emotional state x, when it is low. Individuals with emotional state close to neutrality are more stable psychologically and are hardly induced to euphoria or deep depression.

2. In order to prevent the states of the individual from escaping to infinity, we want a function with a plateau at high influence levels;

3. We want a influence function such that its signal strength (if positive or negative) can be varied by the signal change of a single parameter.

A influence function $I(x)$ that satisfies these properties is $I(x) = c \tanh x$, as shown in blue and green in Fig. (1).

With the influence function $I(x)$, our equation for the dynamics of the psychological state x of the individual in time t becomes

$$\frac{dx}{dt} = a(x) + I(x) = -mx + b + c \tanh x = -\frac{dV(x)}{dx}, \tag{2}$$

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[2]For our purposes, we are defining a psychologically balanced individual as one in which a disturbance of his psychic state decays exponentially with time.
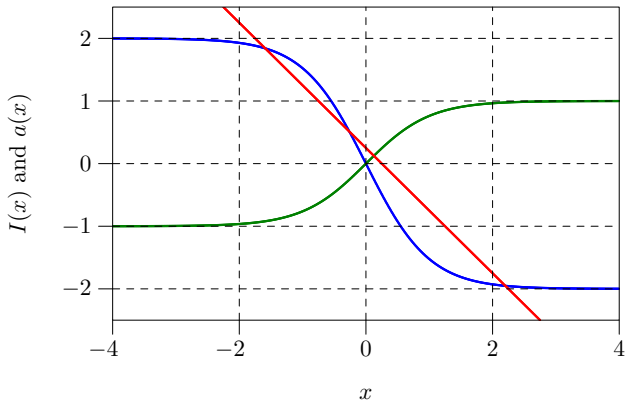
Figure 1: Plot of $-I(x) = -c \tanh x$ for $c = -1$ (green) and $c = 2$ (blue) and function $a(x)$ (red) with $m = 1$ and $b = 1/4$.
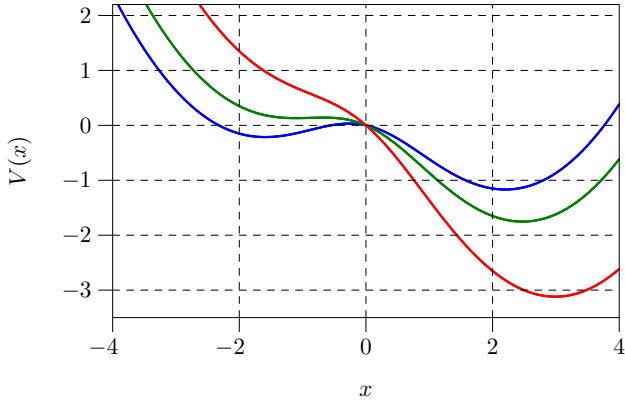

Figure 2: $V(x)$ for $m = 1$, $c = 2$ and $b = 1/4$ (blue), $b = 1/2$, (green) and $b = 1$ (red).

with $V(x) = -bx - c \log[\cosh(x)] + \frac{mx^2}{2}$. The equilibrium points are given by the solutions of $dx/dt \equiv \dot{x} = 0$, i.e, $-a(x) = I(x)$:

$$c \tanh(x) = mx - b \qquad (3)$$

Fig. (1) shows the plots of $a(x)$ and $-I(x)$ for some values of the parameters. Fig. (2) shows the potential $V(x)$ for different values of b. The most interesting case is when $c > 0$: the points of intersection of the red curve with the blue curve in Fig. (1) determine the possible equilibrium points. For the parameter values shown in the caption, the red curve intersects the blue curve in three equilibrium points, $x_1^* = -1.59$, $x_2^* = -0.26$ and $x_3^* = 2.20$. Stability analysis tells us that x_1^* and x_3^* are stable and x_2^* is unstable. This is easily seen in Fig. (2) where the *stable* equilibrium fixed points are represented by the potential wells of the blue line. We also see in this figure that if b increases, we lose the possibility of negative emotional equilibrium. This is represented in Fig. (2) by the progressive disappearance of the left potential wells as b increases. Individuals intrinsically happy (bigger b) are more difficultly induced to a depressive state. Pure common sense.

And what happens if an individual, when momentarily deprived of his state of balance, tends to come back to it very quickly? Mathematically, what happens if m is high? The answer is in Fig. (3). As we increase m, we lost the non-zero valleys of the potential and the only possible equilibrium becomes the complete neutrality ($x \approx 0$). What was an unstable fixed point (a potential peak) becomes a stable one. An individual of quick recovery after perturbed (big m) is a *phlegmatic* individual.

The next step is to ask what the effects of parameter c. The answer is simple: all the qualitative results remain. There are changes only in the values that the parameters b and m should assume to all the phenomenology described occurs.
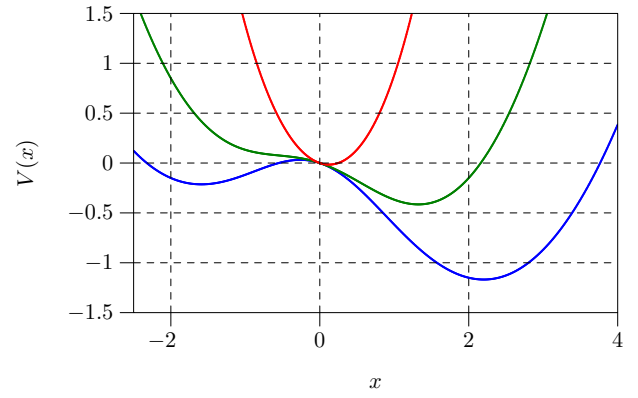

Figure 3: $V(x)$ for $b = 1/4$, $c = 2$ and $m = 1$ (blue), $m = 1.5$, (green) and $m = 4$ (red).

3 Unstable personalities without media influence

Let us understand the possible consequences of unstable personalities. We will do this including the possibility of the defining parameters of the personality, b and m, being random variables.

One possibility to address the intrinsic psychic fickleness of the individual is to consider b as a random variable. We will assume that b is a Gaussian variable so that $b \to b + \zeta(t)$, where $\zeta(t)$ is the white noise with statistical properties $\langle \zeta(t) \rangle = 0$, $\langle \zeta(t')\zeta(t'') \rangle = 2\sigma \delta(t'' - t')$, 2σ is the variance of $\zeta(t)$.

As a Gaussian random variable is not limited, there is the possibility of b be positive or negative, and this possibility will be greater or lesser depending on the *intensity of the noise* given by σ. Intense degrees of mental instability are represented mathematically by large values of σ.

The main principle that will guide us in the interpretation of the following results is:

Any method or technique that lowers a person's emotional state will make the person more susceptible to mind manipulation methods.

For example, malnutrition, sleep deprivation, torture, viruses, chemical toxins, radiation, lying and confusing others will all decrease a person's vitality to a degree.

This principle is partly based on common sense and backed in experiments which indicate that depressed emotional states disfavor making rational decisions [10].

3.1 Stochastic non-zero state of equilibrium

Making the change $b \to b + \zeta(t)$ in Eq. (2) with $c = 0$ and $m > 0$, we will have

$$\frac{dx}{dt} = -mx + b + \zeta(t) \qquad (4)$$

We can write the Langevin equation above as a *stochastic differential equation* (SDE) [11, 12, 13, 14] as follows,

$$\begin{aligned} dx_t &= (-mx_t + b)dt + dW_t \qquad (5) \\ &\equiv f(x_t)dt + g(x_t)dW_t, \end{aligned}$$

which defines the *drift* and *diffusion* functions, $f(x_t)$ and $g(x_t)$, respectively, where dW_t are the Wiener increments of x_t. For this particular case, $g = 1$ and we have additive noise. No ambiguity arises about which stochastic calculus (if Itô, Stratonovich, or other) we will use. This will not be the case in some of the subsequent sections, and so for this article, always consider the Stratonovich calculus.

Eq. (4) describes the well-known Ornstein-Uhlenbeck process [12]. Analytical expressions for the probability density function of the Ornstein-Uhlenbeck process are well known and will not be displayed here. The steady state of the *probability density function* (PDF) of the emotional state of the individual follows Gaussian distribution. Using Eq. (23) of the appendix with $g_2(x) = 0$, the extreme x_m of the PDF is located at $x_m = b/m = x^*$.

Greater variability of b does not induce reductions in emotional states of the individual because x_m does not depend on σ.

3.2 Stochastic "inertia"

Following the same steps of the previous subsection but doing $m \rightarrow m + \zeta(t)$, we have

$$
\begin{aligned}
dx_t &= (-mx_t + b)dt + xdW_t \\
&\equiv f(x_t)dt + g(x_t)dW_t,
\end{aligned}
\tag{6}
$$

with $f(x_t) = -mx_t + b$ and $g(x_t) = x_t$. It is possible to find an exact expression for the PDF but it is too complicated to be useful to us. We prefer a more indirect approach, obtaining an expression of the extremes of the PDF using tools presented in appendix. Using Eq. (23) (see appendix) with $g_2(x) = 0$, the extrema x_m of the PDF is given by

$$
x_m = \frac{b}{\sigma + m}.
$$

Therefore we have a unimodal stationary distribution. We see that m and σ work together to compel the apex of the stationary probability density function to the origin. Phlegmatic personalities tend to be even more phlegmatic if unstable in their phlegmaticity.

4 Unstable personality with media influence

Before we investigate the effects of contradictory stimulation, let us first understand the possible consequences of media effects in unstable personalities. We will do this including the possibility of the defining parameters of the personality, b and m, being random variables.

4.1 Stochastic b with deterministic media influence

Making the change $b \rightarrow b + \zeta(t)$ in Eq. (2), we will have

$$
\frac{dx}{dt} = -mx + b + c\tanh(x) + \zeta(t)
\tag{7}
$$

The corresponding SDE is

$$
\begin{aligned}
dx_t &= [-mx_t + b + c\tanh(x_t)]dt + dW_t \\
&\equiv f(x_t)dt + g(x_t)dW_t,
\end{aligned}
\tag{8}
$$

with $f(x_t) = -mx_t + b + c\tanh(x_t)$ and $g(x_t) = 1$. For these functions, the effective stochastic potential $\mathcal{V}(x)$ (see appendix) does not differ from the deterministic potential $V(x)$, *i.e.* $\mathcal{V}(x) = V(x)$. Then the *average* $\langle x \rangle$ is given by $\langle x \rangle = x^* = b/m$.

Conclusion: For certain values of the parameters, the potentials $\mathcal{V}(x)$ and $V(x)$ have two valleys, which corresponds to a $P_{st}(x)$ with two modal values. This means that the mental states oscillate between two values corresponding to the two potential minima.

4.2 Stochastic "inertia" with deterministic media influence

Following the same steps of the previous subsection but doing $m \rightarrow m + \zeta(t)$, we have

$$
\begin{aligned}
dx_t &= [-mx_t + b + c\tanh(x_t)]dt + xdW_t \\
&\equiv f(x_t)dt + g(x_t)dW_t,
\end{aligned}
\tag{9}
$$

with $f(x_t) = -mx_t + b + c\tanh(x_t)$ and $g(x_t) = x_t$. I was not able to find a solution to the integral in Eq. (20). By simulating the stochastic differential equation (9)[3] I got the results shown in Figs. (4) and (5). We show probability distributions at different times for two different values of σ. The higher the variability of m, we get closer to origin and more symmetrical is the probability distribution of emotional states. The blue distributions in the two figures corresponds to the stationary distributions.
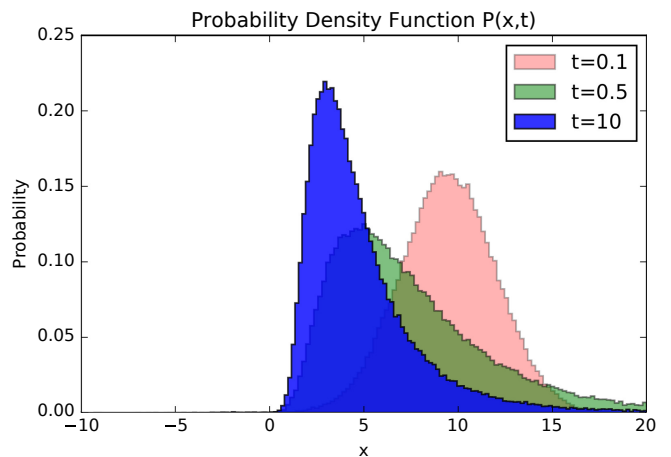

Figure 4: $P(x,t)$ for $b = 1$, $c = 4$, $m = -1$ and $\sigma = 0.4$, for $t = 0.1$ (red), $t = 0.5$ (green) and $t = 10$ (blue). $x(0) = 10$.
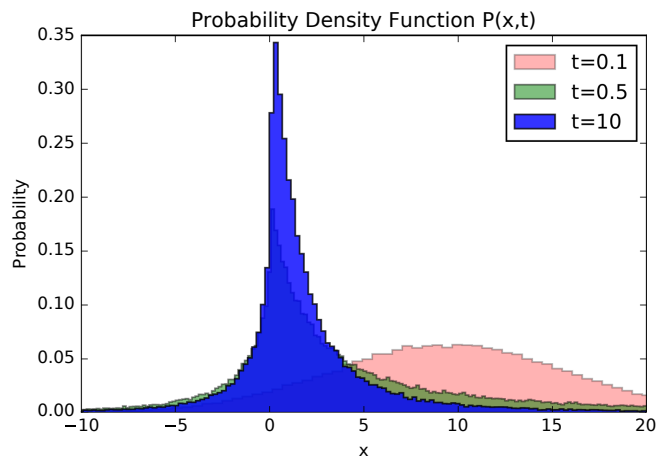

Figure 5: $P(x,t)$ for $b = 1$, $c = 4$, $m = -1$ and $\sigma = 1$, for $t = 0.1$ (red), $t = 0.5$ (green) and $t = 10$ (blue). $x(0) = 10$.

For certain values of the parameters there are two peaks in the $P_{st}(x)$ and mental states oscillate again between the wells of the potential. A slightly more careful analysis is done in the following subsection, which includes the last two subsections as particular cases.

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[3]Using the Euler algorithm [15].

4.3 Full stochastic

What happens if both b and m are treated as random variables? If $b \to b + \zeta(t)$ and $m \to m + \eta(t)$ are placed in Eq. (2), we get the following SDE:

$$\begin{aligned} dx_t &= [-mx_t + b + c\tanh(x_t)]dt + x_t dW_t^1 + dW_t^2 \\ &\equiv f(x_t)dt + g_1(x_t)dW_t^1 + g_2(x_t)dW_t^2, \end{aligned} \quad (10)$$

where $f(x_t) = -mx_t + b + c\tanh(x_t)$, $g_1(x_t) = x_t$, $g_2(x_t) = 1$ and $\eta(t)$ and $\zeta(t)$ are white noises with the following properties

$$\langle \zeta(t) \rangle = \langle \eta(t) \rangle = 0, \quad (11)$$

$$\langle \zeta(t)\zeta(t') \rangle = 2\sigma\delta(t - t'), \quad (12)$$

$$\langle \eta(t)\eta(t') \rangle = 2\Gamma\delta(t - t'), \quad (13)$$

$$\langle \zeta(t)\eta(t') \rangle = \langle \eta(t)\zeta(t') \rangle = 2\lambda\sqrt{\sigma\Gamma}\delta(t - t'), \quad (14)$$

where σ and Γ are the noise intensity of $\zeta(t)$ and $\eta(t)$ respectively, and λ is the correlation between noises. Fig. (6) shows the results of the simulation for the probability density function $P(x,t)$. For the parameter values shown in the caption, we see that a bimodal distribution emerges.
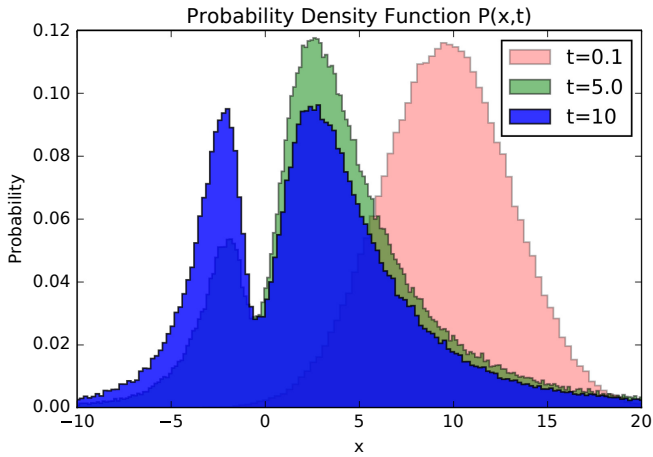

Figure 6: $P(x,t)$ for $b = 1$, $c = 5$, $m = -1$ and $\sigma = 0.25$, $\Gamma = 0.33$, $\lambda = 0.6$ for $t = 0.1$ (red), $t = 5$ (green) and $t = 10$ (blue), $x(0) = 10$.

A simple way to analyze the situation is solving Eq. (23) (see appendix). There is no analytical solution for x_m but it is easy to analyze the results graphically, as done in section (2). The solution results in

$$c\tanh(x) = m'x + b', \quad (15)$$

with $m' \equiv m + \sigma$, $b' \equiv \lambda\sqrt{\Gamma\sigma} - b$. Since Eq. (15) is identical to Eq. (3) exchanging $b \to b'$ and $m \to m'$, the graphical analysis performed is the same just reinterpreting the stable fixed points as peaks of the stationary probability distribution $P_{st}(x)$. Some possible interpretations:

- For $|b'|$ not too big, $P_{st}(x)$ is bimodal. People sufficiently well enough emotionally or sufficiently depressed are not subject to mood swings.

- The lower the slope m', the greater the distance between the peaks of $P_{st}(x)$, if there are two. People with slow recovery of personality, when in the "two peaks" regime, can suffer major mood swings.

- For unimodal $P_{st}(x)$, one possibility is Γ (noise intensity in m) and σ (noise intensity in b) be large, and in this case, the peak occurs at negative values of x. Elevations in σ marginally increase the chances of unimodal $P_{st}(x)$ in the negative x.

- Large variability in the slowness with which the emotional state returns to the equilibrium if disturbed (inertia m with high Γ) induces negative emotional states.

One possibility to produce large intrinsic variability of personality and induce people to a negative level of emotional state relatively easily is to act in children's education. The state monopoly of education becomes very suspect.

5 Contradictory stimulation

> "Find out what will make people become submissive, and you will have discovered the exact amount of injustice and harm that may be imposed on them."

> Frederick Douglass

The man who opens the refrigerator and is undecided about what will eat because of the variety of choice, is already in a state analogous to that of *contradictory stimulation*. However, the situation worsens if it is to know the parents of the girlfriend and her mother tells you that she wants an extrovert man for her daughter while the girl's father says he appreciates quiet guys. The weekly dinners with their in-laws will be painful. But if it is the woman herself who has a capricious character (his favorite color is red/blue, the upcoming holidays can only be in Italy/Caribbean, the dinner is meat/vegan), then our man will become immensely sweet and helpful, satisfying the claims of the woman, because what she always wanted was a poodle.

In this section we will assume the existence of contradictory stimulation. The results do not depend of the truth of this hypothesis if, instead of its previous existence, we propose its creation in this article.

One of the most sordid wiles of modern totalitarian regimes - and one of the most difficult to overcome by citizen intelligence - is a manipulation technique called "contradictory stimulation". It consists of a mass hypnosis technique based on cynical repetition of slogans and statements that contradict the reality that take the listener, if not to the militant hysteria in defense of the *status quo*, to a psychological state known as 'anomie' [16]. Anomie is a state of aimlessness and loss of identity, caused by intense changes and contradictions occurring in the modern social world. From the industrial revolution and the taking of *Reason* in order to explain the world, there is a sharp break with traditional values, strongly linked to religious conception. Modernity, with its intense change processes, provides no new values which meet the earlier demolished, causing a kind of "empty of meaning" in the daily lives of many individuals. There is a feeling of "being adrift", in an unconscious participation of the collective/social processes: almost total loss of conscious action and identity. One of the main hypotheses of this work is that when the individual is in this state, it is easily induced to take actions (or omit them) that otherwise he never would consider.

As an example of social influence on individual destinations, in [16], in which Durkheim develops the concept of anomie, he explores the different suicide rates among Protestants and Catholics, explaining that stronger social control among Catholics results in lower suicide rates. According to Durkheim, individuals have a certain level of integration with their groups, which he calls social integration. Abnormally low or high levels of social integration could result in increased suicide rates:

- low levels because low social integration results in disorganized society, causing individuals to turn to suicide as a last resort;

- high levels because people prefer to destroy themselves than to live under great control of society.

Durkheim's work influenced the proponents of *Social Control Theory* [17].

A physiological example of contradictory stimulation is the Thunberg thermal illusion (or thermal grill illusion TGI) [18]. Using alternating tubes of warm and cold water to generate contradictory stimulation individuals report intense pain. Interestingly in [19] the authors reported intense activity in the anterior cingulate cortex when people are exposed to a warm-cool-warm-cool pattern and placed his hand on them. Coincidence or not, this region is more prominent in liberals than in conservatives [20]. Are the liberals better adapted to the *Orwellian doublethink*[4] standards? In the section where we discuss the results will have more to say about the literary version of the contradictory stimulation, namely, the Orwellian doublethink.

It is noteworthy that the very condition of modern man, immersed in a network of diverse and disparate information from the Internet age, favors a certain degree of confusion, even if there is no deliberate intention. The ease with which you get information that confirms an position often is the same ease with which it gets its contradiction, especially in matters relating to politics, where supposedly antagonistic polarizations as right and left are common.

In the next section we use the previously proposed model, as well as some hypotheses motivated by the discussions above, to investigate the possible effects of contradictory stimulation when modeled mathematically.

6 Model incorporating contradictory stimulation

The bimodal induction or the induction of purely negative states of the previous sections happens to a very small portion of the population. As a example, it is estimated that only 1.4% of the population of the United States of America present borderline personality disorder [22]. This suggests that only a very small portion of the population is susceptible to the effects of intrinsic random stimulus of their personalities. Furthermore, there is no the possibility of any external control over the intensity of these stimuli and on whom such control is applied. To achieve the greatest possible number of affected individuals and to have full control over the influences inflicted, it is proposed the use of the contradictory stimulation strategy.

If the contradictory stimulation exists (or if it does not exist, we invent it now), in our model it will be represented by the possibility that c is a *random variable*. This means that the information disseminated by the mass media can randomly increase or decrease in content intensity and, ultimately, alternate between those that encourage emotional welfare states ($c > 0$) and those that discourage them ($c < 0$). This can be achieved, *e.g.*, *acting subliminally* [23, 24] with contradictory commands such as the criminalization of tobacco users (smokers), a legal activity, with the concomitant decriminalization of drug use, especially marijuana.

Making the change $c \to c + \zeta(t)$ in Eq. (2), we will have

$$\frac{dx}{dt} = -mx + b + c \tanh(x) + \tanh(x)\zeta(t) \quad (16)$$

where $\zeta(t)$ is the white noise associated to σ as in the previous sections. Aggressiveness, in politics, in exposing citizens to the effects the contradictory stimulation is represented by large values of σ.

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[4]The power of holding two contradictory beliefs in the mind at the same time, to tell deliberate lies while genuinely believing in them, and forget any fact that has become inconvenient [21].

We can write the Langevin equation above in the following form

$$
\begin{aligned}
dx_t &= [-mx_t + b + c \tanh(x_t)]dt + \tanh(x_t)dW_t \\
&\equiv f(x_t)dt + g(x_t)dW_t, \quad (17)
\end{aligned}
$$

which defines the *drift* and *diffusion* functions, $f(x_t)$ and $g(x_t)$, respectively.

The expression for $\mathcal{V}(x)$ can be easily obtained from Eq. (20) but it is complex and not very useful for our purposes, and therefore it will be omitted.

Fig. (7) shows the effective potential for some values of σ. We see that as we increase the intensity of contradictory stimulation, σ, quickly the emotional state of the individual collapses to *apathy*. If anyone wishes induce mass of individuals to a state of complete *torpidity*, as apparently (or explicitly?) wants Noam Chomsky[5], we seem to find a clue.
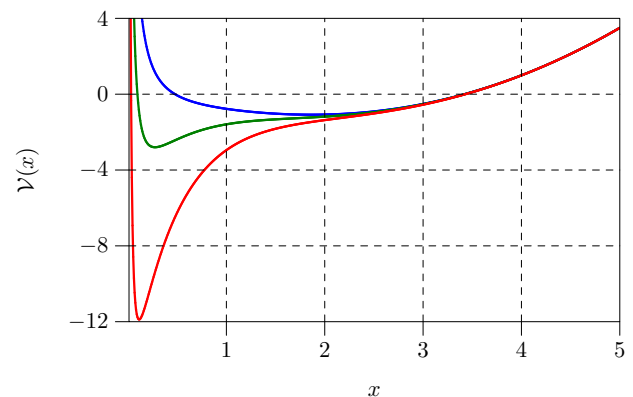

Figure 7: $\mathcal{V}(x)$ for $b = 1$, $c = 1$, $m = -1$ and $\sigma = 0.5$, (blue), $\sigma = 1$, (green) and $\sigma = 1.5$ (red).

Something interesting also occurs when we vary c. Fig. (8) shows that as c increases from a certain value, the potential has two wells, indicating that there is a *bimodal* distribution of stationary probabilities.
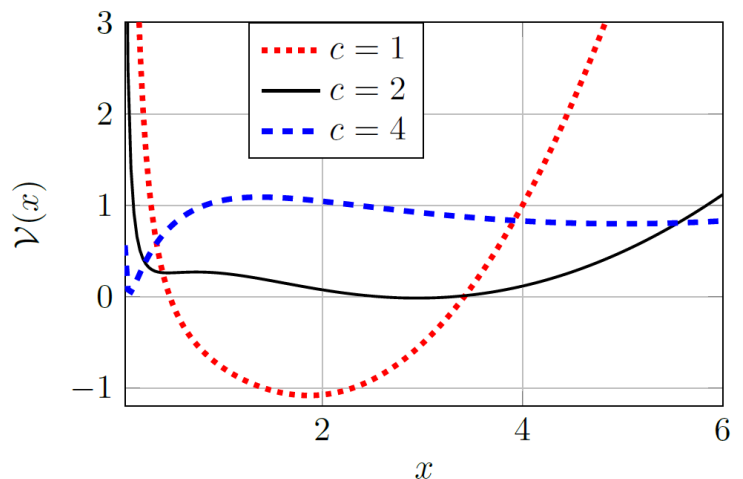

Figure 8: Effective stochastic potential $\mathcal{V}(x)$ for some values of c.

With intense influence functions (high c), an individual can be in two different emotional states, one of them apathetic or *lethargic*, in which the individual is literally at the rock bottom, and the other positive, away from the origin. The psychic condition of the individual oscillates randomly between these two possible states, but once it is in the lethargic state, it will be hard to leave him if c is large enough. And once in the positive state beyond the origin, the unstable mental aspect of the

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[5]Author of the first quotation taken from in this article.

individual is manifested in the almost flat appearance of the potential.

Interestingly, the deeper the potential well, higher the corresponding state of euphoria (x far from origin). The individual may manifests itself totally apathetic and lethargic, but euphoric outbursts can sometimes occur.

6.1 Two noises

In line with what was done for the case without contradictory stimulation, we will consider the possibility that more than one parameter varies stochastically. The first situation that we analyze is that of both b and c are random. Along the same lines than was previously presented, let $b \rightarrow b+\zeta(t)$ and $c \rightarrow c+\eta(t)$, $\zeta(t)$ and $\eta(t)$ following (11-14).

Using Eq. (23) with $g_1(x) = c\tanh(x)$, $g_2(x) = 1$, we have

$$mx - b = c\tanh(x) - \text{sech}^2(x)\left(\lambda\sqrt{\Gamma}\sigma + \sigma\tanh(x)\right) \quad (18)$$

Exact analytical solution for Eq. (18) does not exist. Again we appeal to a graphical solution, shown in Fig. (9). This figure
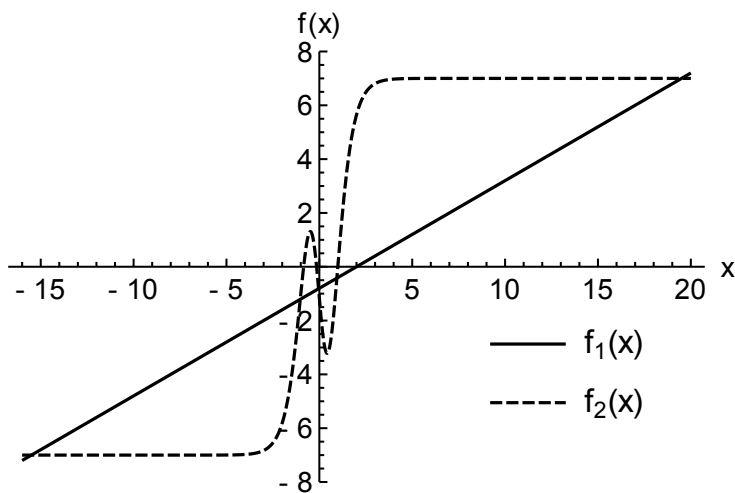
Figure 9: Graphical solutions of (18) for $b = 0.8$, $c = 7$, $m = 0.4$ and $\sigma = 15$, $\Gamma = 1$, and $\lambda = 0.3$ with $f_1(x) = mx - b$ and $f_2(x) = c\tanh(x) - \text{sech}^2(x)\left(\lambda\sqrt{\Gamma}\sigma + \sigma\tanh(x)\right)$

predicts the occurrence of an unexpected event: the emergence of a stationary multimodal distribution, with three peaks, which is confirmed by Fig. (10) where we present $P(x,t)$ for three values of t. In addition to being induced to negative psychic states
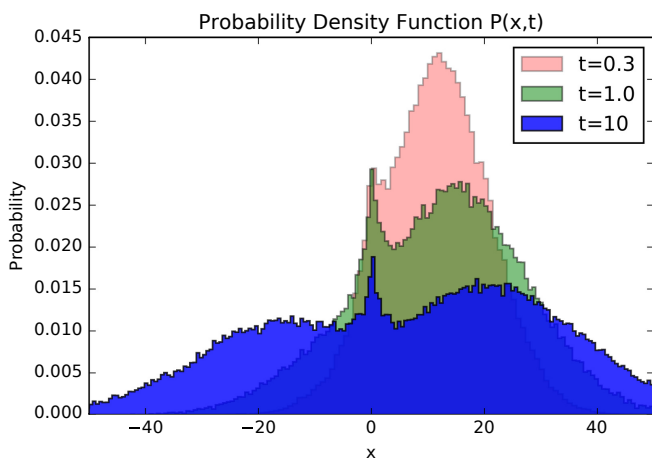
Figure 10: $P(x,t)$ for $b = 0.8$, $c = 7$, $m = 0.4$ and $\sigma = 15$, $\Gamma = 1$, $\lambda = 0.3$, for $t = 0.3$ (red), $t = 1.0$ (green) and $t = 10$ (blue). $x(0) = 10$.

if $x(0) > 0$, persons subject to contradictory stimulation tend to show erratic behavior, alternating states of euphoria to depression, through apathy states. Similar qualitative conclusions are obtained when we consider as stochastic the parameters m and c.

7 Discussion

There is a branch of human creativity that seems to have described the type of ruse analog to contradictory stimulation in incredible detail: part of the literature presented as *fiction*. I conjecture that the characterization as fiction might be to disguise the cruel reality. A well-known example is George Orwell's novel, titled 1984 [21]. In this book, the most obvious concept that expresses similar characteristics to the contradictory stimulation is the concept of *doublethink*. In the author's words:

> To know and not to know, to be conscious of complete truthfulness while telling carefully constructed lies, to hold simultaneously two opinions which canceled out, knowing them to be contradictory and believing in both of them, to use logic against logic, to repudiate morality while laying claim to it, to believe that democracy was impossible and that the Party was the guardian of democracy, to forget whatever it was necessary to forget, then to draw it back into memory again at the moment when it was needed, and then promptly to forget it again, and above all, to apply the same process to the process itself that was the ultimate subtlety: consciously to include unconsciousness, and then, once again, to become unconscious of the act of hypnosis you had just performed. Even to understand the word 'doublethink' involved the use of doublethink.

In 1984: George Orwell, 1949 [21], p. 35.

Doublethink is a system of contradictions in that one must know and not know simultaneously. Because doublethink is illogical, one can see the long term detrimental effects on the intellect. Ironically, the more one utilizes doublethink, the more one becomes insane. This insanity is the exact intention of the Party. Doublethink is similar to trance logic among hypnotized subjects when they try to create a rational explanation for an irrational perception. Hypnotized subjects know their hallucinations are not real while simultaneously trying to believe that they are real. Doublethink similarly induces doubt and the need for the person to convince him or herself that what is not real should be so. It seems there is a natural tendency to doubt what is real, but in Oceania[6], according to Orwell, the people know this is not the case and desperately try to convince themselves otherwise. *Consequently, when people are intensely confused about reality, it is very easy to sway them in one direction or another.* Nothing is more characteristic of the version of contradictory stimulation in Orwell that the slogan of the party:

WAR IS PEACE, FREEDOM IS SLAVERY,
IGNORANCE IS STRENGTH

which appear on a telescreen.

In another classic novel, Brave New World, Aldous Huxley, 1933 [25], there is a thought control version: thought control is *hypnopaedic*[7] and *Pavlovian* conditioning with the primary focus on children. Essential to hypnopaedia are the recordings

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[6]Oceania is the superstate where protagonist Winston Smith dwells.
[7]The art or process of learning while asleep by means of lessons recorded on disk or tapes.

that play in the ears of all the children as they sleep, conditioning them to believe specific ideals and act accordingly. Most of these hypnopaedic recordings are messages encouraging contentment in one's assigned social class. Huxley shows us a result of one of these messages: "Alpha children wear grey. They work much harder than we do, because they're so frightfully clever. I'm really awfully glad I'm a Beta, because I don't work so hard. And then we are much better than the Gammas and Deltas. Gammas are stupid. They all wear green, and Delta children wear khaki. Oh no, I don't want to play with Delta children. And Epsilons are still worse. They're too stupid to be able... "

In addition to hypnopaedic conditioning, children are molded according to Pavlovian principles. Delta infants, for example, are exposed to electric shocks when they reach out for books and flowers. Subjecting children to these shocks allows the state to subvert their love of nature and books and turn them against these things. This is a common practice exacted upon the lower classes because the love of beauty and literature will not maintain the consumer culture which is so important in Brave New World.

Scientific experiments that support such procedures and also its effectiveness, can be found in [26] and [27], books that deal with the *cognitive resonance*, from Leon Festinger, and *transmarginal inhibition*, from Ivan Pavlov.

8 Conclusion

In this article we propose an idea by which we can analyze the complex state of affairs of the modern political world. The essence of what has been stated is that the highly acclaimed scientific and technological advances have a hidden face through which those who are interested in maintaining their hegemony can acquire powerful means of action. It is perfectly plausible, given human nature, that dynastic families claim the maintenance of their dynasties. Perhaps this is the truth most widely demonstrated throughout history. Perhaps it has also been for millennia the driving force behind the quest for wealth and knowledge. But I am afraid that this journey is at its turning point. The whole history of the world we know has occurred in circumstances that are no longer observed. The limitations of scarce resources are manifest in the very general understanding of things offered by scientific advancement. Advertisements in the sense of inducing this belief are increasingly frequent and intense. A battle for your mind is waged every day in the usual information channels at infinite speed, with possibly dangerous consequences [28, 29, 30]. The Malthusian limit for human coexistence will be tested in various spheres of life, not only that of food and other material aspects. We do not know the collective effects, in global terms, and psychic, in terms of the individual, of the ease of digital interconnection between people as opposed to physical distance, with all the frivolity and artificiality involved [31], but also with the enormous mobilization capacity and risks [32].

The very idea of the possibility of organized action at the global level as perverse as that provided through contradictory stimulation may sound as something totally unrealistic and even ridiculous to the most pure and naive minds. I end this text with another quote from someone who has had a lot of influence in academic and political circles. We close the text with a quotation from the same person with whom we introduced the article, namely, Noam Chomsky.

"Walter Lippmann ... described what he called "the manufacture of consent" as "a revolution" in "the practice of democracy"... And he said this was useful and necessary because "the common interests" -

the general concerns of all people - "elude" the public. The public just isn't up to dealing with them. And they have to be the domain of what he called a "specialized class" ... [Reinhold Niebuhr]'s view was that rationality belongs to the cool observer. But because of the stupidity of the average man, he follows not reason, but faith. And this naive faith requires necessary illusion, and emotionally potent oversimplifications, which are provided by the myth-maker to keep the ordinary person on course. It's not the case, as the naive might think, that indoctrination is inconsistent with democracy. Rather, as this whole line of thinkers observes, it is the essence of democracy. The point is that in a military state or a feudal state or what we would now call a totalitarian state, it doesn't much matter because you've got a bludgeon over their heads and you can control what they do. But when the state loses the bludgeon, when you can't control people by force, and when the voice of the people can be heard you have this problem — it may make people so curious and so arrogant that they don't have the humility to submit to a civil rule [Clement Walker, 1661], and therefore you have to control what people think. And the standard way to do this is to resort to what in more honest days used to be called propaganda, manufacture of consent, creation of necessary illusion. Various ways of either marginalizing the public or reducing them to apathy in some fashion."

In Manufacturing Consent: Noam Chomsky and the Media, 1992 [1, 2]

Appendix

We make use of some results of the theory of stochastic processes which we summarize here.

The stationary probability distribution $P_{st}(x)$ is given by (for simplicity, $x_t \to x$) [33]

$$P_{st}(x) = \mathcal{N} \exp\left[-\mathcal{V}(x)\right], \tag{19}$$

where $\mathcal{N}$ is the normalization constant and the *effective stochastic potential* $\mathcal{V}(x)$ is

$$\mathcal{V}(x) = -\int \frac{A(x')}{B(x')} dx' + \ln\left[B(x)\right] \tag{20}$$

with

$$
\begin{aligned}
A(x) = \quad & f(x) + \sigma g_1(x)\frac{dg_1(x)}{dx} + \lambda\sqrt{\sigma\Gamma}g_1(x)\frac{dg_2(x)}{dx} \\
+ \quad & \lambda\sqrt{\sigma\Gamma}\frac{dg_1(x)}{dx}g_2(x) + \Gamma g_2(x)\frac{dg_2(x)}{dx}
\end{aligned} \tag{21}
$$

and

$$B(x) = \sigma[g_1(x)]^2 + 2\lambda\sqrt{\sigma\Gamma}g_1(x)g_2(x) + \Gamma[g_2(x)]^2 \tag{22}$$

The extremes x_m of the stationary probability density function are found using the following equation [33]:

$$
\begin{aligned}
0 = \quad & f(x_m) - \sigma g_1(x_m)\frac{dg_1(x_m)}{dx_m} \\
+ \quad & \lambda\sqrt{\sigma\Gamma}g_1(x_m)\frac{dg_2(x_m)}{dx_m} + \lambda\sqrt{\sigma\Gamma}\frac{dg_1(x_m)}{dx_m}g_2(x_m) \\
+ \quad & \Gamma g_2(x_m)\frac{dg_2(x_m)}{dx_m}.
\end{aligned} \tag{23}
$$

We can obtain the mathematical expectation $\langle F \rangle$ of a function $F(x,t)$ using [34]

$$\left\langle \frac{dF}{dt} \right\rangle = \left\langle \frac{\partial F}{\partial t} + f(x,t)\frac{\partial F}{\partial x} + \frac{g(x,t)^2}{2}\frac{\partial^2 F}{\partial x^2} \right\rangle \tag{24}$$

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