

## Plastic Additives in Bodily Fluids Have Hormonal and Behavioral Effects

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### Abstract

It is known from the ubiquitous presence of plastic additives in the environment (air, water and land) worldwide, that the human body anywhere (including the Arctic) is bombarded by these compounds daily. It is not surprising then there is ubiquitous presence of plastic additives in human bodily fluids around the world, facilitated by the numerous pathways of these organic compounds into our bodies. It has been shown that Bisphenol A (BPA) and phthalates upset the hormonal balance in the human body, more in some than in others. In particular, BPA has been demonstrated to cause an adverse effect on sperm and fertility. The United States Food and Drug Administration has expressed "concern about the potential effects of Bisphenol A on the brain, behavior, and prostate gland in fetuses, infants, and young children." Additionally, that endocrine disruptors can cause phenotypes to form, foretell consequences in the fields of environmental contaminants, evolutionary biology and disease pathology. There is thus suspicion that occurrences of homosexuality, lesbianism and transgender characteristics can partly be attributed to these modern environmental contaminants (introduced by mankind). Research needs to be done to establish this suspicion.

**Keywords:** Polychlorinated Biphenyls; Bisphenol A; Phthalates; Soy; Homosexuality; Lesbianism; Transgender

### Background

Though the literature is replete with research and scholarly works regarding the behavioral, social sciences and politics of homosexuality (including same sex attraction of both male and female sexes i.e. both 'homosexuality' and 'lesbianism' in everyday language) and transgender sexuality, there is hardly any on causation. The common understanding is that homosexuality and transgender characteristics are genetic in origin. For instance, reference [1] is one with 'health' in its title, but the work deals mostly with the more obvious health issues of the Lesbian Gay Bisexual and Transgender (LGBT) community. The current paper investigates probable causes from the nutritional and environmental perspective.

Reference [2] is a publication regarding the effect of soy on the sexual responses of female rats. This 2004 work showed the negative effect of soy on the sexual behavior of said rats. This modern research confirms knowledge which has been used by Buddhist monks for ages. Soy contains substances that imitate the female hormone estrogen, and lower the intensity of the male hormone, testosterone [3,4]. The elder monks used to feed the teenage monks with soy to control their 'rowdy' behavior. In other words, the elder monks were aware of the ability of soy to help suppress the raging hormones of teenage boys going through puberty. In general, Buddhist monks used tofu, a food product from whole soy beans, to help with sexual abstinence since each one of them had vowed to lead a chaste life. The facts presented is evidence that mankind knew for quite a long time that human sexuality can be influenced by nutritional intake. The advent of male enhancement drugs, etc. are the modern products growing out of this knowledge and targeted research and development.

Biologists know that homosexuality is common in the animal kingdom. The author witnessed a homosexual act between two male sea lions on one Galapagos island, which was pointed out by the official guide of the tour group. The fact is that homosexuality is a natural

result of variability in gene expression in the animal kingdom. That certain fishes become male and female at different times of their life-cycles are evidences of bisexuality.

Xenoestrogens are a kind of xenohormone that mimics estrogen. They are either man-made or natural chemical compounds. Man-made xenoestrogens are extensively used industrial compounds, such as phthalates, Bisphenol A (BPA) and Polychlorinated Biphenyls (PCBs) which have estrogenic effects on a living organism. They are not identical to the estrogenic substances produced internally by the endocrine system of any creature. Xenoestrogens are relevant to the discussion at hand since they imitate the functions of internally and naturally produced estrogen. They are responsible for precocious puberty, for instance, and other disorders of the reproductive system.

### Literature Review

In [5], a review was done about BPA, a component of plastics. It was found that this compound, which is found widely in the environment, caused gene changes in multiple generations of rats, and also altered their behaviors. BPA affects the brain and reproductive tissues [5]. It is clear from [6] that BPA is the major estrogenic substance leaching into our water and food supplies. It is also the finding of [7] that BPA was found in the urine samples of 95% of the population. The 2014 Food and Drug Administration (FDA) reported “some concern about the potential effects of Bisphenol A on the brain, behavior, and prostate gland in fetuses, infants, and young children.” [8]; this administration report is based on various research works, amongst them is [9]. It has been shown in [9] that BPA has heritable adverse effects on sperm function and fertility.

Reference [10] is a research work by Rubin., *et al.* which showed that BPA affected the estrous cycles of female rats, among other effects. Reference [11] is a work on the inhibition of testicular function of male rats by BPA. In other words, their work demonstrated that BPA caused problems with the masculine status of the rats.

In [12], endocrine disrupting activity was investigated in bottled mineral and flavored water. One or more classes of hormonal activity was detected in about seventy-eight percent of the test samples, a high number. It was concluded that the intensity found in each type of endocrine disruptor is not something to worry about with respect to health. However, it was stated that extended exposure and mixture effects need to be researched.

Reference [13] confirms that there is a lot of plastics and plastic wastes in the environment. It was a 2010 research project sponsored by the United States National Institute of Environmental Health Sciences.

Reference [14] was one of the works which contributed to the findings of the expert panel [6], that included “The wide range of adverse effects of low doses of BPA in laboratory animals exposed both during development and in adulthood is a great cause for concern with regard to the potential for similar adverse effects in humans. Recent trends in human diseases relate to adverse effects observed in experimental animals exposed to low doses of BPA. Specific examples include: the increase in prostate and breast cancer, uro-genital abnormalities in male babies, a decline in semen quality in men, early onset of puberty in girls, metabolic disorders including insulin resistant (type 2) diabetes and obesity, and neurobehavioral problems such as attention deficit hyperactivity disorder (ADHD).” A verbatim quote is given to provide an exact version to the reader, and not lose anything with the paraphrasing.

Reference [15] is the work of a panel in 1996 regarding the research needs on the subject of endocrine disruptors. Main findings was that research should be focused on the effect on reproductive ability by these endocrine disruptors, and the combinatorial result of mixtures and the calculation of exposure. Reference [16] is research work that showed endocrine disruptors introduced into female rats had transgenerational adverse effects on male fertility of the off-springs born from said females. In reference [17], it was stated that capability of an endocrine disruptor (environmental contaminant) to stimulate an epigenetic transgenerational phenotype has implications about the possible dangers of environmental contaminants, disease etiology and evolutionary natural science. These sentiments are echoed by the review paper [18] and the book [19].

### Routes of human exposure to plastic additives

From [20], it is clear that there are many pathways of plastic additives into the human body. The quotation listing these pathways is as follows:

- “Microwaving foods (esp. acidic and fatty entrees) in plastic containers TV dinners in plastic trays or with plastic film.
- Boil-in bag foods.
- Migration into cheeses/meats, etc, from stretch wrap.
- Hospitalization or medical procedures (stents, catheters, IVs, respiratory devices). IV Bags with fatty substances like food or blood contain up to 50% DEHP
- Pacifiers, baby bottles and children’s toys.
- Cooking with Teflon cookware.
- Canned foods lined with plastic lacquer.
- Eating fish/meats/dairy products (phthalates in food chain).
- Baby foods and infant formulae.
- House dust (e.g. PVC dust from common household vinyl’s such as flooring).
- Air (e.g. phthalates released from plastic car interiors i.e. that “new car” smell, vinyl flooring)” [20].

These common paths or entry methods into a human’s body simply explains why there is ubiquitous presence of phthalates in human bodily fluids, which include blood. It is quite clear that it is almost impossible to avoid phthalates completely in one’s everyday life since it is there in house dust and in the air, we breathe. The use of this list comes from helping us avoid unnecessary additional exposure to BPA and phthalates.

### Discussion and Conclusion

The work of [2] is one of many works that confirmed that soy can have an effect on sex hormones and thus sexual behavior, like BPA and phthalates in general. In [12], it was concluded that the long-term endocrine disruptive effects of bottled (in plastic) mineral and flavored water has not been studied, nor the various combinatorial effects. However, the links that were established point to the suspicion that BPA and phthalates have long term adverse effects on reproductive capability [12,14]. Work can be done to research whether BPA and phthalates in the human body may be long-term risk factors in the causation of homosexuality and transgender characteristics in the fetus. Research should be done to establish these connections. It is the public’s duty to keep these contaminants out of the environment. If this clean-up is too difficult and demand too much resources, then society should at least face up to the responsibility of accepting homosexual and transgender people as possible results of the environmental conditions. Governments should also not look upon the LGBT community as deserving of marginalization or punishment.

It is common sense and therefore obvious that entry into this world via the birth canal, under natural conditions, should not be marginalized or illegal in any land under any enlightened government.

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