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JSM Sexual Medicine

Research Article

Concepts on Sexuality and Human Sexuality Need a Deep Revolution

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Abstract

Most studies on human sexuality have been performed from clinical, psychological, cultural or anthropological frames. However, sixty years ago the studies of sexuality in viruses, bacteria, protozoan, fungi, plants and animals had an explosive development. This scientific and cultural evolutionary revolution has not had a relevant incidence in human sexuality in spite that they challenge the nucleus of the human sexuality disciplinary matrix. Also clinical or anthropological characters are not net or unambiguous phenotypes as to perform more conclusive results; genetic heterogeneity is mostly the rule. These studies have demonstrated that the nuclear feature of sexuality is the process of production of new genomic recombinant individuals that are better adapted than their ancestors. This evolutionary viewpoint seems to be invisible for most clinicians, psychologists, psychiatrists, anthropologist, sexologists and student of human sciences. I present a new integrative vision of human sexuality from an evolutionary and genetic viewpoint and define sharp phenotypes. Here, sexuality can be only applied to species; individuals have sex and not sexuality. There are several instance of genetic and somatic sex: genetic, chromosomal, gonadic, internal genitalia, external genitalia, neural, hormonal and gametic. Neuropsychic sex presents several instances: configuration of sexual identity, configuration of sexual appetence, sexual psychomotor form or content, somato-erogen context or connection, genital connection and integration of neuro-psychic sex with total personality. Other instances are social sex and the interactive psycho-social sexual element or pheno-syntony, and legal sex. A new description of sexual phenotypes is proposed.

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Submitted: 23 June 2020

Accepted: 04 July 2020

Published: 05 July 2020

ISSN: 2578-3718

Keywords

- Evolution
- Human sexuality
- Sexuality
- Sex instances
- Sexual phenotypes

INTRODUCTION

In the following analyses I use ancient well known concepts widespread in biology and new insights on reproduction and sexuality. I avoid cites of these well-known concepts or facts. At present human sexuality is often dealt with as a separate process, with no connection to the remaining processes of sexuality of the biotic world. This is a non-rigorous, non-scientific position regarding the widespread acceptance of biotic evolution and genomic revolution. In words of Dobzhansky one of the geneticists and evolutionists who developed the synthetic theory of evolution "nothing in biology makes sense, except in the light of evolution" [1]. Human medicine works with *Homo sapiens* a species involved in the evolutionary process; thus Dobzhansky's statement may be transformed in "nothing in medicine makes sense, except in the light of evolution" [2]. Now evolutionary medicine pervades all the fields of medicine [3,4].

Sexuality a biotic view

The problem arises by the different colloquial, clinical and scientific meaning of sexuality. Colloquially, it is the capacity of sexual feelings; the quality or state of being sexual; among other similar meanings. The anthropic or clinical bias of these definitions is evident; they cannot be applied to most known sexual processes in viruses, bacteria, plants, animals, fungi, humans and most living beings.

Sexual processes have an invariant element: the production of genome recombinants. Thus a sexual process implies the encounter and recombination of genomes and production of new genomic recombinant individuals. Sexuality is then the capacity or ability of species to have sexual processes and produce individuals with recombinant genomes. Sexuality consequently is not a property of individuals but of species; terms as heterosexual, bisexual or homosexual referred to individuals are not pertinent and mostly erroneous. The notion of sex follows straightforward: characters that allow individuals to participate or produce sexual processes. Sexuality [5] is a particular case of the more generalized process of transference and recombination of DNA between individuals either of the same or different species [6,7]. In sexuality the transference is precise in relation

to the part of the genome which is involved. I proposed to update human sexuality, particularly sexual phenotypes, more than 25 years ago, but this was not spread into the scientific or clinical community [8].

Reproduction

Reproduction is the production of new living beings from ancestors. The reflexive condition (re-production) is erroneous because living beings produce living beings but they do not self-produce. A cell or a unicellular organism divides (a kind of self-production) producing two new cells, but it disappears in the process.

Reproduction and sexuality

Reproduction and sexuality are very different processes; in prokaryotes they are separated. In unicellular eukaryotes they are often separated, as in paramecium, but both are also present in most of these organisms that have sexual and a-sexual reproductive cycles, with their haplo and diplo phases. In multicellular organisms both associate or overlap extensively, sexual processes are mostly performed by specialized cells, the gametes [9]. In mammals they are completely associated; however, asexual reproduction as monozygotic twining (cloning) is conserved. A few species do not present known sexual processes, but it is very probable that they have hidden sexuality or horizontal transference replaces sexuality [9].

THE EVOLUTIONARY VIEW OF SEXUALITY

Evolutionarily, sexuality is a process of synthesis where selected genomes from different environments and selective conditions are recombined to produce a genome adapted to those different environments and conditions. Hundred articles have been written to solve the adaptive condition of sexuality; this subject will not be dealt with here. I propose to consider sexuality as the process that give historical and contingent advantages for historical and contingent changes of selective conditions that can lead organisms to reach new adaptive peaks; thus sexuality accelerates the construction and deconstruction of genomes to fit species (not necessarily the individuals) to the always changing environment [10-12]. It is more evident that sexuality is a trait of species.

The pedagogic example of bacterial resistance is useful. A bacterium C living in the environment C1 is adapted and resistant to the antibiotic C2; this bacterium is put into the environment D1 where the bacterium D lives in the presence of antibiotic D2 to which it is resistant. Bacterium C is sensible to antibiotic D2 and should die in its presence. If bacteria D transfer the information of resistance to D2, either by a sexual process or another type of transference to C, it should become resistant to D2 (and C2) and will live in environments C1 or D1. Sexuality is too expensive, for one new recombinant resistant to C2 and D2, three bacteria are going to die in the environment with C2 and D2: C, D and the recombinant sensible to C2 and B2. To be efficient sexuality needs that individuals going to recombination of their genomes come from historically different environments. Natural selection produced mechanisms to warrant that both partners are at least of different mating types or sexes. Two different partners, male and female occur in several species but in fungi there are dozens, hundreds or thousands of mating types; the necessary polar or heterosexual condition of sexuality is universal, with few exceptions. When bacteria return to the original environments they do not need resistance genes and original mutants or recombinants, that could be better adapted to this original situation, may appear; then mutation and sexuality can reverse (deconstruction) genotypes.

HUMAN SEXUAL PHENOTYPES

Our disciplinary matrix (paradigm) is the synthetic theory of evolution that I have revised [13]. This theory includes from Mendelian genetics until the present genomics, epigenomics, transcriptomics, proteomics, etc. We need to describe first the main instances or phenotypes of human sex. I did it, 25 years ago [8].

Instances or levels of sex

Genic sex: defined by the presence of SRY that elicits the gene cascade of development of the undifferentiated gonad into testes [14]. If SRY, or some of the genes of the cascade, is missing an ovarian develops.

Chromosome sex: XX for females and XY for males; SRY is normally present in the short arm of chromosome Y close to the pairing region of X-Y chromosomes (PAR 1 zone).

Gonadic sex: testes in males, ovarian in females, ovotestes or both in hermaphrodites.

Internal genitalia sex: embryos are bisexual having mainly the "male duct" or mesonephric duct (Wolff's ducts) that originates the epididymis, deferent ducts and seminal vesicles (prostate develops from urethral tissue), and the female duct or paramesonephric duct (Müller's duct) that originates the uterine tube (Fallopian tubes), the uterus and the proximal vagina. If testes develop they secrete anti-Müllerian hormone that leads to the atrophy of the uterine tube and uterus, and androgen mostly testosterone (transformed in dihydrotestosterone acts on prostate and external genital system) that leads to the development of epididymis, deferent duct and seminal vesicles. If non-testes and ovarian develops the low level of androgens leads to atrophy of male ducts and estrogens made uterine ducts and uterus develop.

External genitalia sex: three main structures appear in the embryo, the genital tubercle, the genital swellings, and the urethral folds. If there is testosterone transformed in dihydrotestosterone by the 5-alpha reductase the genital tubercle develops in penis, the urethral folds into the urethral plate and the genital swellings into scrotum. The lack of androgens and presence of estrogens allow the transformation of the genital tubercle in clitoris, the genital swellings in labia majora and the urethral folds in labia minora. As the female external genitalia are closer to the original indifferent genitalia, for practical, pedagogical and clinical purposes, they have been treated as they are female in the origin and should be masculinized (androgenized) to become male external genitalia.

Neural sex

It refers to the sexual dimorphic differentiation of the nervous system. The studies have been addressed mostly to the

brain and it is well established that the critical sex dimorphism begins in the embryo-fetus stage (mostly 10-20 weeks), but the sexual differentiation continues along the whole life; at birth several brain regions show sexual dimorphism [15-17]. Not only circulating hormones as androgen or estrogen act as differentiators, but intra-cell or in situ hormones, the SRY gene, and several genes in the Y chromosome or in other chromosome.

Endocrine sex

Includes the sexual dimorphic level of hormones and the critical tonic or cyclical functioning of the endocrine system in male and female organisms, respectively. Most of this system lies in the hypothalamus-hypophysis structure.

Gametic sex

As it is known spermatozoids and ovules (oocytes) present a capital sexual dimorphism. Besides that the genomes of spermatozoids and ovules are imprinted complementarily by epigenetic mechanisms [18-20]. I cannot analyze this process extensively; so I propose a pedagogic analog. Near 150 loci are genomically imprinted in gametes; let us imagine that, in spermatozoids (male or paternal imprinting or androtype), the alleles of even loci are active and the alleles of odd loci are inactive; in ovules the alleles of odd loci are active and those of even loci are inactive (female or maternal imprinting or gynetype). A human zygote is constituted by a heterotypic (heterosexual or paternal-maternal) union of male and females imprinted gametes. The homotypic (homosexual) union of male gametes (androgenones with exclusive androtype imprinting) that happens when an oocyte fertilized by two sperms loss the nucleus of the oocyte is not a human zygote; it leads to a development of a dangerous proliferative tissue that can metastasize in the maternal organism even in her brain; it is named hydatidiform mole (it is found around 1/300 pregnancies). The homotypic imprinted union of female gametes (gynogenones with exclusive gynetype imprinting) is less known, but it does not lead to a human zygote and may constitute a teratoma. Then gamete heterotypy (heterosexuality) is crucial and necessary to construct a human being [19]. This imprinting continues during the whole development. If an error in the distribution of chromosome occurs at mitosis and a cell receives two paternal or two maternal chromosomes some anomalies, named parental disomies, are seen in the descendant cells. Several syndromes have been described in relation to these disomies [21].

The neuro-psychic sex [8]

Here the heterogeneity among phenotypes, clinical levels, nomenclature, ideological positions, and several other cultural instances is universal and does not allow a consistent and coherent disciplinary matrix. For a geneticist, as Mendel, the first task is to dissect unambiguous phenotypes.

The configuration of sexual identity

(A mental construction with neuro-psychic location and dynamic installation): it includes the auto-assignation, acceptance, empowering, and assignation conscious, unconscious or subconscious of a sense of belonging to or to be a membership of a neuro-psychic sexual state. It has, at least, a deep component, the nuclear sexual identity constructed from the endogenous neuro-psychic system and afferences (the sex differentiated neural system and the internal processing and integrations of all these afferences) and exogenous elements (mostly prenatal); and an integrated peripheral component mostly dependent on vital experiences. All the scientific and clinical experience indicates that the nuclear identity is prenatally or at most perinatally determined (compare this with the DSM-V classification).

The configuration of sexual appetence

(A mental construction of sexual preference): it includes those human or non-human configurations for which the individual has erotic attraction, sexual arousal, positive erotic feelings, emotions, valuations, affections, and with whom has erotic fantasies, oneiric dreams, falling in love, and sexual rapport or activities. In the present classification this phenotype replaces the sexual orientation of psychiatry or psychology (see DSM-V). As a phenotype sexual orientation is a diffuse quantitative trait that does not include the discrete reality of a specific loved person and the non-loved or non-erotic (or neutral) person who not only does not elicit our erotic impulse (neutral) but sometimes generates negative erotic feelings, in spite of he/she belongs to the sex we currently love.

Sexual psychomotor form or content

It is the sexual dimorphism of the neuro-psycho-muscular system specified in behavior and in movements. The same movement is different in males and females. There are differential forms and contents of movements.

The somato-erogen context or connection

The erotic quality of our personality is present in variable grades in our body. Also it includes our feeling on our anatomical part and on those of others. It is important the sexual attraction for anatomical sexual landmarks.

The genital connection

The relationship and integration of appetence, identity and the other instance of sex with the genital organs; culture and sexual education is related with it. Premature ejaculation, frigidity, impotence are related pathological conditions.

Integration of neuro-psychic sex within the total personality

It includes the relationship with moral and ethics, temperament, egosyntony and egodystony, feelings and any other trait of personality (for the mind-body connections you can read Alfred Adler and the following authors and studies).

Social Sex

The nuclear part of the social sex is constituted by the ideas, feelings and behaviors oriented to form a human sexual (to produce genome recombinants) and reproductive (new individuals) couple that guarantee the maintenance of the species and its genome variation. The peripheral part of social sex includes any other feeling, behavior or cultural element related to the sexual expression in the human society. Today we see a separation between the sociability of couple constitution

and the reproductive and sexual aims, and a parallel cultural development named gender ideology. These seem to me a necessary cultural platform to construct the foundation of rights and social conditions of justice and equality among genders, but it differs qualitatively from social sex and sexuality even though it can be included in social sex.

A self-referred Psycho-Social sexual element: pheno-syntony-dystony

An important phenotype is the self-evaluation of the figure presentation to the society and to oneself. It includes how individuals accept their body and dresses. I called this phenotype as the pheno-syntony, pheno-dystony and pheno-neutrality (udeteroty, too complicated). It is applied to any external or eventually internal appearance of the body or to particular dresses with which a person feels well, bad or neutral.

For most if not all these sexual instances mutations, alternatives, varieties have been described and studied. The genetic-environmental determinations of these varieties is a well-developed field of research, even though results are often matter of debate, perhaps because these studies work with clinical or psychological defined conditions for whole individuals, but not with sharp unambiguous isolated phenotypes or traits. Thus genetic and phenetic heterogeneity is a commonplace in these studies.

Legal sex

The sex assigned to the individual at birth or any other stage of development. It follows in general the appearance of the external genitalia; male, female and ambiguous sex.

There are several phenotypes related to sexual characters as style of socialization or human relationships within a human couple; it includes abuse, seduction, integration, collaboration, pathology, etc. Another very important character is the universal search for the pleasure, and its maximal expression the search for orgasm. Normally it is controlled by the brain motor regulation and the moral continence. In a normal development it is harmonically integrated with the whole set of sex instances and end in a well-integrated couple; however, it may be out of modulation and leads to sexual aggressions that are not necessarily abuse. In the Chilean popular language this impulsive drive or feeling is called, in Greek translation, thermos, (sexual hotness or excitement). These other phenotypes related to sex cannot be dealt with here. To complete the whole process of sexuality it is necessary that all the instances or levels of sex be integrated, so as to ensure the production of recombinants for the following generation. Mutations or variants in only one level may make the production of recombinant individuals of this couple impossible.

NOMENCLATURE

The somatic instances of sex presented previously from genetic sex (SRY) to endocrine sex have its own nomenclature that is not possible to present here because any instance has several variants and they are several hundred in number. We shall deal with the whole somatic sex, the neuro-psychic sex and a simple mention to the psycho-social sex (syntony-dystony). Previously, it is necessary to correct a widespread lexicological error. Love has several meaning in Greek [22]. Philia means friend love; eros means sexual love; agape means spiritual love; storge means familial love. To use philia for erotic appetence is an error; parents and pediatricians love their children; they are pedophiliac. The correct term for erotic love is erastia (also erasty, from eros and phonetic adaptation), in this case pederastia (pederasty). Thus we must change philia by erastia in the classifications as in the DSM-V classification. I use erastia, as in pederastia, and not asty as in pederasty (or any astia and not asty) because, here phenotypes are the matter of study and not conditions of an individual or person, the synonymous is not valid.

The somatic sex

It is assigned to the baby at birth mostly according to the external genitalia, in our nomenclature gynesomic, androsomic, gynandrosomic (both sexes) and xenosomic (ambiguous, estrange. bizarre).

The configuration of identity

It may be tautandric (male auto-identity), tautogynic (female auto-identity), tautogynandric (female and male auto-identity), tautoxenic (rare, estrange or bizarre sex identity).

The configuration of appetence

Gynerasta (men and lesbians); androerasta (women and gays); gynandroerasta (bisexuals); xenoerasta (attraction for the rare or bizarre); pederasta (attraction for prepubertal children, sexual development Tanner 1, or less than 11 years of age); heberasta (Tanner 2-3; 11-14); epheboerastas (Tanner 4, 15-16); teleierastas (young adult people, Tanner 5, over 16 years); gerontoerastas [23,24]; the bizarre attractions as zooerastas, necroerastas, etc. The sexual development is seen on genitalia, pubic hair, breast development, axillary hair, voice change (at puberty) and menarche. These attractions or erastias imply the antithetical feelings: aversions, phobias or repulsions; misogynia, misandria, misogynandria, misoxenia, misopedia, misozoo, misonecro. In relation to the somatoerogen connection some specific anatomical feelings and attractions are important. Men are often attracted by women breast: mastoerastia; or for their buttock: pygerastia; also for the female genitals or pubis region: gynecoerastia. Women and gays may be attracted by the male genitals particularly by the penis: phalloerastia; in our clinical and life experience testes are not object of attraction (orcoerastia); they are considered ugly and object of joke (balls, eggs, etc.). These terms as philia were created by G. Manriquez; CY Valenzuela and EV Vivaldi, the change to erastia is mine. Any region of the body, character (also personality aspects), trait, voice, form of movement or thinking may attract sexually to someone; this are not treated here.

Sexual psychomotor form

Kinegynia; kinandria; kinegynandria; kynexenia.

Pheno-syntony-dystony

We have phenandro-syntonic; phenogyne-syntonic; phenogynandro-syntonic; phenoxenic-syntonic. The dystonic counterparts are: phenandro-dystonic; phenogyne-dystonic;

Table 1: Common sexual conditions and phenotypes of sex instances.

Condition	Somatic form	Identity	Appetence	Psychomotricity
Heterosexual man	Androsomic	Tautandric	Gynerasta	Kinandric
Heterosexual woman	Gynesomic	Tautogynic	Androerasta	Kinegynic
Homosexual man	Androsomic	Tautandric	Androerasta	Kinandric
Homosexual woman	Gynesomic	Tautogynic	Gynerasta	Kinegynic
Male-female T-S[a]	Androsomic	Tautogynic	Variable	Kinandric[b]
Female-male T-S[a]	Gynesomic	Tautandric	Variable	Kinegynic[b]
Man transvestite	Androsomic	Tautandric	Gynerasta[c]	Kinandric
Woman transvestite	Gynesomic	Tautogynic	Androerasta[c]	Kinegynic
Condition	Imprinting	Phenosyntony		
Heterosexual man	Androtype	Androsyntonic		
Heterosexual woman	Gynetype	Gynesyntonic		
Homosexual man	Androtype	Androsyntonic[d]		
Homosexual woman	Gynetype	Gynesyntonic[d]		
Male-female T-S[a]	Androtype	Gynesyntonic[d]		
Female-male T-S[a]	Gynetype	Androsyntonic[d]		
Man transvestite	Androtype	Gynesyntonic[d]		
Woman transvestite	Gynetype	Androsyntonic[d]		

[a] = Transexual, transgenders may present a wider spectrum; [b] = before hormonal treatment; [c] = basic appetence, it may vary; [d] = syntony may vary. Transvestite is net transvestite (not mixed cases)

phenogynandro-dystonic; phenoxenic-dystonic. Since all these terms have the prefix pheno, it may be suppressed and named as androsyntonic, gynesyntonic, etc. The reader may construct the neutral condition.

As it is seen, there are not references to heterosexuality, homosexuality or bisexuality. As it was indicated sexuality is a condition of species not of individuals. Heterosexuality here is simply heteroerastia, homosexuality is homoerastia and bisexuality is bierastia. In this classification any sex instance has equal importance; the appetence or sex orientation is as important as the differentiation of the primitive gonad, internal or external genitalia, identity, etc. Another error comes from philology, heterosexuality is a philological hybrid: hetero is Greek and sex is Latin. My proposition corrects also the incoherence between homo, hetero or bisexuality and pederasty that should be pedesexuality. Also there is no reference to sexual dysphoria (clinically defined), because this is a particular case of pheno-syntony-dystony. Paraphilia also disappears (from this exclusively phenotype classification not for clinical purposes). Table 1 shows some examples of syndromes according to the present classification. A very important new way is open to propose sexual development from these phenotypes without needing psychoanalysis. We can describe the formation of, as for example, androerastia or tautogynia by the direct phenotype interactions of parents with their children. Boys whose brains are inclined to maleness since birth identify with their fathers (men) and love their mothers (women) with whom they cannot identify completely [8].

Two very important related fields of science have not been mentioned the neuroscience and genetics of sexuality. Both fields have an enormous development, but I cannot enter in its analysis [24-27].

ACKNOWLEDGEMENTS

My colleagues working in basic sciences as well as those working in Psychology, Psychiatry and Genetics have given me important clinical data.

Funding

None extraordinary funds were provided for this work.

Competing interests

I do not have any competing interest.

Availability of data and material

Non applicable, all is found extensively in literature and citations.

Code Availability

Non applicable

Author's contribution

CYV carried out all the work described in this article

Author's information

It is sufficient the information given in the title page and references

Consent for publication

The author approves the publication of this manuscript.

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Cite this article

Valenzuel CY (2020) Concepts on Sexuality and Human Sexuality Need a Deep Revolution. JSM Sexual Med 4(5): 1043.