

8-10 May 2014, University of Lausanne, Switzerland

NeuroGenderings III

The 1st international Dissensus Conference
on brain and gender

Unil
UNIL | Université de Lausanne



Metropolis, Fritz Lang 1927

Book of Abstracts

TABLE OF CONTENTS

THE GENDER THEORY OF THE VATICAN : A NEUROSCIENTIFIC CRITIQUE Odile Fillod & Catherine Vidal	3
HARDWIRED : HISTORTY OF A MISLEADING METAPHOR Giordana Grossi	4
YOUNG IN HIS/HER HEAD : A CRITICAL HISTORY OF THE ADOLESCENT BRAIN Christel Gummy	5
QUEERING GENDER USING POSITIVIST METHODS : AN EXAMPLE FROM A STUDY OF GENDER IDENTITY IN « NORMATIVE » INDIVIDUALS Daphna Joel, Ricardo Tarrasch, Zohar Berman, Maya Mukamel & Effi Ziv	6
PLASTICITY AS BOUNDARY OBJECT Annelies Kleinherenbrink	7
THE MYSTERIOUS SEX/GENDER PATTERNS OF INDIVIDUAL DISPOSITIONS AND CHOICES Hanna Meissner	8
POVERTY IN THE BRAIN ? THEORIZING NEURAL PLASTICITY Victoria Pitts-Taylor	9
QUEERING GENDER IN THE “NORMATIVE” BRAIN Jared Pool & Daniel Margulies	10
SEX/GENDER ASSESSMENT IN PSYCHOLOGY, NEUROPSYCHOLOGY AND RELATED EMPIRICAL SCIENCES Diana Schellenberg	11
PLASTIC BRAINS – FEMINIST MATERIALISM – NEOLIBERAL CONTEXTS : NOTES FOR A DISSENSUS DEBATE Sigrid Schmitz	12
TESTOSTERONE AS TROJAN HORSE : CONSTRUCTING A FEMINIST AND QUEER BIOSCIENCE WITH SOCIAL NEUROENDOCRINOLOGY Sari van Anders	13
FROM FACTS TO VALUES : IDEAS OF EQUALITY, DIFFERENCE AND FLOURISHING IN DUTCH DEBATES ON GENDER – SPECIFIC EDUCATION Ties van de Werff	14
THE DISSENSUS OF THE APPARATUS : HOW TO FRAME A META-ANALYSIS OF THE USES AND CONCLUSIONS SURROUNDING THE APPARATUS KNOWN AS LORDOSIS Rachel Weitzenkorn	15
CITED REFERENCES	16
ACADEMIC PARTNERS & SPONSORS	17

THE GENDER THEORY OF THE VATICAN : A NEUROSCIENTIFIC CRITIQUE

ODILE FILLIOD, Author of the Blog Allodoxia (allodoxia.blog.lemonde.fr), France
CATHERINE VIDAL, Pasteur Institute, Paris, CNRS, Neurobiology, France

In France in 2011, the introduction of the notions of ‘sexual identity’ and ‘sexual orientation’ in high school natural science textbooks raised the anger of conservative catholic circles and of many right-wing deputies. The controversy continued to grow in 2012-2013, with massive demonstrations against the legalization of same-sex marriage as well as several months of debates in the media and political arena, and it did not end after the law was passed.

The advocacy of these conservative views on gender and sexuality took the form of a denunciation of the so-called ‘gender theory’, defined as an ideology that denies both the biological reality of sex differences in humans and the supposedly resulting ‘natural complementarity’ between men and women.

The Catholic Church has been a key player in the initiation and spreading of that denunciation. Its critique of the ‘gender theory’ was particularly developed in the *Lexicon* (2003), a critical dictionary issued by the Pontifical Council for the Family. After a first publication of the *Lexicon* in France in 2005, the chapters on gender and sexuality were reprinted in *Gender - La controverse* (2011), a book designed to provide decisive arguments in the controversy about natural science textbooks.

Here we present a critical analysis of the scientific evidence cited in this book as a support to the notion that gendered behaviors, gender identity, and heterosexuality are in part biological in origin.

The careful examination of the cited references reveals that they do not support this claim. As we will show, this book exemplifies various common types of misuses of the scientific literature by ‘experts’, including citing obsolete literature, relying on recent non-replicated studies, overstating animal studies, and misinterpreting the outcomes of neuroimaging studies. Furthermore, even some of the cited evidence which is generally accepted as important in the field of neurobiological sex differences turns out to be very weak, to say the least.

Yet, for the general public, the presented arguments can be seen as based on scientifically validated facts. In the current climate where essentialist arguments reappear to attack gender studies, it is crucial that biologists engage with social scientists to not only challenge the false evidence claiming that the social order mirrors the biological order, but also criticize the fallacious reports of the state of knowledge.

Catherine Vidal is a Neurobiologist and Research Director at the "Institut Pasteur" in Paris. She holds a PhD and a "Doctorat d'État" in neurophysiology (Paris University). Her current research relates to the neuropathology of Creutzfeld-Jacob and prion diseases. Catherine Vidal is also involved in popularising sciences, in particular neuroscientific findings on sex/gender and their societal implications. She is the author of a large number of articles and books for the general public.

Vidal, C. 2012. The sexed brain: between science and ideology. *Neuroethics* 5(3): 295-303.

Odile Fillod is an engineer with a specialization in applied mathematics and a post-graduate degree in cognitive science. As PhD student in sociology, she explored the production and popularization of scientific discourses lending credence to the notion of ‘natural’ psychological sex differences. She currently works as independent researcher in science studies, with a focus on bio-medico-psychological studies of interindividual and intergroup differences.

Fillod, O. 2013. Le mariage raté du Vatican et de la science. <http://allodoxia.blog.lemonde.fr>.

HARDWIRED : HISTORY OF A MISLEADING METAPHOR

GIORDANA GROSSI, State University of New York at New Paltz, Department of Psychology, USA

Human beings are often said to be “hardwired” for some type of behavior (e.g., prejudice, morality, and mating preferences). The term has enjoyed a wide and enduring popularity in reference to sex differences. In her popular books, Louann Brizendine (2006, 2010) informs the readers that women and men behave differently because their brains are “hardwired” differently, due to their different hormonal realities. Similarly, Baron-Cohen’s *The Essential Difference* (2003) opens with the claim “The female brain is predominantly hard-wired for empathy. The male brain is predominantly hard-wired for understanding and building systems.” (p. 1).

“Hardwired” is a term borrowed from the field of engineering and it refers to the fixedness and unchangeability of a structure or function (Oxford English Dictionary, 1969). The term then became widespread in psychological and brain sciences. Furthermore, perhaps because the existence of a purportedly “hardwired” biological structure invites speculations about its origin, the term started to assume the meaning of “genetically or innately determined: inborn” (Merriam-Webster’s online dictionary, n.d.). Current synonyms of the term include “built-in, constitutional, essential, immanent, inborn, inbred, ingrained, innate, intrinsic, natural” (Merriam-Webster’s online dictionary, n.d.). Therefore, the borrowing of the term “hardwired” from engineering and its application to biology implied a complication of its meaning in terms of origins. It is this complication that, in the absence of operational definitions and information on how development occurs (typically not provided in publications for the general public), leaves the door open for misinterpretations. Indeed, the term’s meaning often shifts when used in different contexts, even within the same book.

In order to understand how the concept of “hardwiring” has become widespread and accepted in public discourse to explain behavior, I started tracing and analyzing its use by searching scientific databases and using tools like Google Books Ngram Viewer and LexisNexis. The Ngram Viewer allows researchers to search millions of books published from 1600 to 2008 and provides an index of how frequently a word is used each year (Greenfield, 2013, p. 3). Therefore, frequency changes can be documented for specific words, and cultural aspects related to the use of those words can be quantified (e.g., an increase in frequency often signals a broadening of the meaning that a certain word assumes). In my talk, I will provide a preliminary analysis of the contexts in which the term “hardwired” first appeared and how its use and connotations have changed over time.

Giordana Grossi is a Professor of Psychology at the State University of New York at New Paltz. Her empirical work explores the cognitive and neurophysiological underpinnings of reading in monolinguals and bilinguals. She also studies sex differences research, in particular the methodological and epistemological problems that characterize such research.

Grossi, G., & C. Fine. 2012. The role of fetal testosterone in the development of “the essential difference” between the sexes: Some essential issues. In Bluhm, R., A. Jacobsen & H. Maibom, Eds. *Neurofeminism: Issues at the Intersection of Feminist Theory and Cognitive Science*. Basingstoke, UK : Macmillan-Palgrave.

Nash, A., & G. Grossi. 2007. Picking Barbie’s™ brain: Inherent sex differences in scientific ability? *Journal of Interdisciplinary Feminist Thought* 2(1): 29-42.

YOUNG IN HIS/HER HEAD : A CRITICAL HISTORY OF THE ADOLESCENT BRAIN

CHRISTEL GUMY, University of Lausanne, Institute of social sciences, Switzerland

The adolescent brain is presented by cognitive and developmental neurosciences as a "discovery" of the late 1990s, attributed to new brain imaging techniques. These techniques, because of their non-invasive nature, would have allowed a large-scale investigation of human brain development, multiplying the number of individuals followed by age of life. They would have thus made visible developmental characteristics related to adolescence, so far ignored.

The neuroscientists working on the in vivo visualization of brain development during adolescence situate nevertheless their researches in a scientific genealogy that refers to works in histology from 1960 to 1980. In the reading of current neuroscientists, these studies in histology on brains after death have already brought two major elements that support imaging researches: first, the indication of continued myelination of the prefrontal cortex in adolescence and, secondly, the indication of synaptic reorganization in this period of development.

By questioning this linear history from a critical and a gender point of view, the goal is to put the produced knowledges on the adolescent brain in perspective with policies and health concerns related to young people. I hypothesize that brain imaging techniques, more than a technological advance, constitute a privileged place of convergence for adolescence sciences. One may ask what kind of interdisciplinary platform offer the neurosciences which study the adolescents brain development, particularly with fMRI. Neurosciences, developmental and evolutionary psychology, epidemiology, even anthropology seem to find a common ground to contain the "young" risk in the head of adolescents.

Christel Gumy is PhD candidate at the Institute of Social Sciences, University of Lausanne. Her PhD thesis in history of science and medicine focuses on cerebral theories of adolescence, in a gender perspective. She is also free associate of the Institute of History of Medicine and Public Health (IHMSP) in Lausanne and member of the research group "Psychiatrie, neurosciences, sciences humaines et sociales - PNS3".

Gumy, C. In press. The Gendered Tools of the Construction of a Unisex Adolescent Brain. In S. Schmitz, & G. Höppner, Eds. *NeuroCultures – NeuroGenderings* (working title). Vienne: Zaglossus e. U.

Gumy, C. 2013. Les images des passions adolescentes. Des photographies d'expression faciale aux images scans dans la construction d'un cerveau adolescent émotionnel et sexué. *Revue d'Anthropologie des Connaissances* 7(3): 589-604.

QUEERING GENDER USING POSITIVIST METHODS : AN EXAMPLE FROM A STUDY OF GENDER IDENTITY IN « NORMATIVE » INDIVIDUALS

DAPHNA JOEL, Tel-Aviv University, School of Psychological Sciences and Sagol School of Neuroscience, Israel

RICARDO TARRASCH, Sagol School of Neuroscience, Tel-Aviv University, Tel-Aviv, Israel

ZOHAR BERMAN, School of Education , Tel-Aviv University, Tel-Aviv, Israel

MAYA MUKAMEL, The Graduate School of Creative Arts Therapies, University of Haifa, Israel

EFFI ZIV, NCJW Women and Gender Studies Program, Tel-Aviv University, Tel-Aviv, Israel

Mainstream psychological and psychiatric discourses build on a dichotomous perception of gender and view gender identity as coherent and unitary. Although feminist and queer theoreticians have criticized dichotomous models of gender on several grounds, there has been no attempt to study whether the gender experience of 'normative' people (i.e., people who self- identify as man or woman) indeed transcends the either/or logic of the binary gender system. We aimed to study this question from a Positivist perspective. In so doing we were challenged by the inherent tension between the Positivist approach that presupposes an objective reality, which we can come to know by using strict value-free observations or measurements, and the post- structuralist critical perspective of Queer theories. This tension affected every aspect of the study, from the formulation of the research question to the discussion of the results.

The research question was formulated to reflect our "queer" assumption that gender is not a natural attribute or essence at the core of a person but rather a cultural construct which becomes a core component of one's identity. Thus, we aimed to study the perception of gender identity in a society that views "being a man" and "being a woman" as natural experiences within a naturalized dichotomous gender system. To this end we used a multiple-choice questionnaire that assesses the perception of gender identity as both "man" and "woman", but uses only these two options. By using a multiple-choice questionnaire instead of open-ended interviews and by restricting ourselves to the either/or binary gender logic, we were able to recruit a high number of 'normative' individuals for whom a more "queer" questionnaire could have been incomprehensible, at the expense of obtaining more accurate descriptions of gender experience from fewer people. We built on existing questionnaires for the assessment of gender identity/dysphoria in constructing our questionnaire, with two modifications: we assessed the perception of gender identity as a man and as a woman for each participant and omitted all reference to how a normative individual should feel. We decided to modify existing questionnaires instead of constructing all questions anew in order to strengthen the validity of the new questionnaire and thus the acceptance of our "queer" findings. For a similar reason we presented the data using means and standard deviations and analyzed them using quantitative statistical methods (e.g., analysis of variance), yet in addition presented the data using scatterplots. In this way we were able to show the response pattern of each subject and present the highly variable gender experience of individuals, while at the same time adhering to conventions of data analysis. We tried to keep the same balance in the Discussion, by including the sections expected in every scientific paper as well as a critical section on the clinical and social implications of our results.

Prof. **Daphna Joel** received her Ph.D. in psychology in Tel-Aviv University, and joined the faculty of TAU in 1998. Prof. Joel is presently the head of the Psychobiology graduate program at the School of Psychological Sciences and a member of the Sagol School of Neuroscience. Prof. Joel's research interests focus on questions related to brain, sex and gender, and in particular the complex interplay between sex and environment in the development of psychopathology.

Joel, D. 2011. Male or female? Brains are intersex. *Frontiers in Integrative Neuroscience* 5: 57.

Joel, D, Tarrasch R., Berman Z., Mukamel M. & Ziv E. In press. Queering gender: studying gender identity in the normative population. *Psychology and Sexuality*.

PLASTICITY AS BOUNDARY OBJECT

ANNELIES KLEINHERENBRINK, Amsterdam University, Amsterdam school for Cultural Analysis, Netherlands

Neuroscientific theories of sex/gender have been widely criticized by feminist scholars. At the same time, productive dialogues across disciplinary borders prove that neuroscience and feminism are not necessarily antithetical. In these discussions, the notion of neuroplasticity is commonly invoked. Despite the buzz surrounding this notion, neuroscientific studies of sex/gender rarely seem to reckon with plasticity. To do so would shift the empirical agenda of neuroscience from reproducing binary differences to understanding the dynamical development of the embodied, enculturated brain. This latter concern puts feminist and neuroscientific interest into close contact– for example, by prompting questions about the (neuronal) embodiment of power mechanisms and the possible ways to intervene in such processes.

Cynthia Kraus characterizes plasticity as a ‘boundary object’, since it generates such fruitful conversations and collaborations between feminist theory and neuroscience (Kraus, 2012^[12]). This paper explores this idea further: to what extent, and in which ways, does plasticity function as a boundary object for feminist theory and neuroscience? A boundary object is an interpretatively flexible entity that links different communities together. As a shared object of interdisciplinary conversation, boundary objects have weakly defined identities. Yet within each community, they are specifically tailored according to local requirements (Star & Griesemer 1989^[16]). As such, boundary objects allow cooperation without consensus. I attempt to track how plasticity is defined as a shared object between feminist theory and neuroscience, how it is locally tailored within each community in non-interdisciplinary contexts, and how workers tack back and forth between both forms.

This analysis is motivated by other questions, which I hope to shed light on by tracking plasticity as a boundary object: how come the notion of plasticity can be used both to challenge and to reinforce the mainstream perspective on sex/gender differences (Kraus, 2012^[12])? Under what conditions does it provoke neuroscientists to change their focus, and under what circumstances is the notion reconciled with the idea of binary difference (e.g. ‘women are born with a more plastic area X than men’)? What are the different implications of studying ‘the plasticity of sex differences’ and studying ‘sex differences in plasticity’? When, and how, is the notion altogether rejected or ignored? Is consensus about the ‘correct’ meaning and use of plasticity desirable and productive? What would such standardization exclude?

Annelies Kleinherenbrink (MSc in Clinical Psychology, MA in Women’s Studies) is a PhD student at the Amsterdam School for Cultural Analysis, part of the University of Amsterdam. Her principle research interests are the intersection of feminism and neuroscience, neuroplasticity and its implications for theories of sex/gender, and new materialisms.

THE MYSTERIOUS SEX/GENDER PATTERNS OF INDIVIDUAL DISPOSITIONS AND CHOICES

HANNA MEISSNER, Technical University of Berlin, Center for Interdisciplinary Women's and Gender Studies (ZIFG), Germany

The situation is paradoxical. Discourses of equality have made it virtually illegitimate to assume that women (or men) are not suitable (qua sex/gender) for certain tasks. Career choices, interests, divisions of labor now appear decidedly rooted in individual dispositions and decisions. There is a certain sense of puzzlement: We know that, in principle, women are capable of rocket science while men are capable of caring for small children. How can it be that so many women seem to express disinterest in technology, while so few men choose a profession in child care?

Against this general backdrop, I consider research interests in neuroscience aiming to explain behavioral differences between men and women in terms of differences in their brains. I put these research interests and practices in touch with methodological individualism in social sciences, famously epitomized in the homo oeconomicus and his human capital. I thus situate the problem in a specific constellation in which a neoliberal notion of the self-serving individual has become foundational for hegemonic social ontology.

This ontology sets the stage, even for critical debates, by proscribing specific problematizations. In light of this, rather than approaching the puzzle of pervasive sex/gender patterns via the question of natural dispositions vs. social constructions and, implicitly, the question of who should be in charge of finding explanations (natural sciences or humanities/social sciences), it seems promising to focus on the puzzlement in terms of (transdisciplinary) joint perplexities (Roy 2011): How can feminists in different fields and disciplines learn to ask different questions, to put forward different problematizations, to work differently with the binary of nature/culture?

Instead of focusing on sexed/gendered individuals it may be helpful to focus on the heterosexual matrix as an apparatus straddling nature and culture. This allows different questions linking individual bodies, desires, sexual orientations with the ordering of social institutions and practices, and it problematizes the onto-epistemological (Barad 2007) effects of heteronormative culture's ability to impose itself as natural expression of society. This matrix, bridging the disjunction of individual dispositions and social institutions, brings into focus an historically singular amalgamation of nature/bodies and culture/sociality positing gendered behavior simultaneously as individually contingent and naturally determined.

From the perspective of feminist critique the "necessarily and desirably queer nature of the world" (Warner 1993) can function as a powerful counter-truth. An (ethically and politically) important question would then be how to invent practices of knowing aimed at visualizing fluidity, indeterminacy, and potentiality instead of explaining facts and discovering certainties.

Hanna Meißner is postdoctoral assistant at the Center for Women's and Gender Studies (ZIFG) of the Technical University Berlin. She received her degree in sociology (Diplom) from the Free University Berlin in 1997 and defended her Ph.D. dissertation at Humboldt University Berlin in 2009.

Her main fields of interest are feminist theory, social theory, science studies, and postcolonial studies. Currently she is particularly interested in the ways that (collective) agency can be conceptualized as a material-discursive process of becoming, taking into account and questioning the specific historical conditions that bring forth an understanding of agency as a property of human subjects.

POVERTY IN THE BRAIN ? THEORIZING NEURAL PLASTICITY

VICTORIA PITTS-TAYLOR, City University of New York Queens College and the CUNY Graduate Centre
Department of Sociology, USA

Neural plasticity presents something of a conundrum for feminists. On the one hand, plasticity is appealing as a description of human ontology. Feminists have long argued that biology is amenable to cultural influence, and neuroplasticity offers biological grounding for the ideas that the gendered, raced or classed subject is “a sedimentation of established habits,” and that power materializes in the body (Malabou 2008; see Fausto-Sterling 2000, Jordan-Young 2010). Further, as I elaborate in this paper, Dussauge and Kaiser’s (2012) suggestion that neuroscientists take sex/gender as performative requires the recognition of the performativity (and thus the plasticity) of the brain itself. On the other hand, plasticity can be seen as a scientific representation of biology that is dangerously consonant with neoliberalism, with its demands for the flexibility, mobility, choice and enhancement of individuals, and plasticity underpins the flexible cerebral subject who must undertake practices of neuronal self-improvement (Vidal 2010, Pitts-Taylor 2010, Papadopoulos 2012, Martin 2010, Schmitz 2012, Kraus 2012). Given its co-production with the social, political and economic order, feminists have questioned whether plasticity can be a resource for critical theorizing (Kraus 2012).

In this paper, I bring these contradictory insights together by considering plasticity in Karen Barad’s terms as a material-discursive phenomenon (Barad 2007), one that necessarily bears the imprints of our observation. From this viewpoint, neurobiological plasticity refers to both the activity of the brain and how we measure it, and sees these as impossible to fully separate. I use the example of the “poverty brain,” where neuroscientists claim to find distinctive neurobiological traits among low SES and poor children (eg, Farah et al 2012, Kishiyama et al 2008). Neuroscientists argue that through mechanisms such as higher stress, poverty has neurobiological effects that account for lower cognitive performance. I argue that the identification of brains as distinctly poor is neither a positivist exercise of discovery, nor a mere social construction. Rather, the research program itself is part of the phenomenon it names. For Barad, “Changing patterns of difference are neither pure cause nor pure effect,” but rather are that which “enacts a causal structure” (2007: 137). The neuroscience of poverty has material consequences that, in the examples I discuss, are highly racialized as well as classed.

The paper aims to make two contributions to the feminist literature on neural plasticity. First, I argue for an onto-epistemological approach that cuts through distinctions between the material real and its representation. Second, I hope to identify the critical stakes of feminist theorizing of neuroscience beyond sex/gender to race and class.

Victoria Pitts-Taylor is Professor of Sociology, Director of the Center for the Study of Women and Society, and Coordinator of Women’s Studies at the Graduate Center, City University of New York as well as Professor of Sociology at Queens College, CUNY. She is the author of two books and many articles and book chapters on social and cultural aspects of the body, medicine, and health and wellness. In 2013, she published an article on feminist interpretations of mirror neurons in the journal *Hypatia*. The book she is currently writing, *The Brain's Body*, examines neuroscientific and feminist ideas of embodiment; it will be published by Duke University Press.

QUEERING GENDER IN THE “NORMATIVE” BRAIN

JARED POOL, Max Planck Institute for Human Cognitive and Brain Sciences, Leipzig, Germany
 DANIEL MARGULIES, Max Planck Research Group "Neuroanatomy and Connectivity", Leipzig, Germany

The human connectome — as the mapping of all brain connections — is, much like genetics in the last decade, becoming the focus of research into the biological correlates of individual differences and identity. Notions of sex/gender nonetheless remain underdeveloped in research practice in comparison with other phenotypic categories relating to cognitive, clinical and developmental variation. Therefore, as part of ongoing connectivity data collection at the Max Planck Institute for Human Cognitive and Brain Sciences in Leipzig, we are acquiring data relating to participants sexual orientation, gender identity, and self-reported sex as acquired by Joel and colleagues (2013^[6]). Building on pioneering though theoretically limited large-scale studies into connectome-sex relationships (eg, Biswal et al., 2010^[3]), operationalizations of gender (e.g. Gong et al., 2011^[5]; Tomasi & Volkow, 2012^[19]) and orientation proclivities (for a brief review see Swaab, 2008^[17]), our current study extends efforts regarding gender perception / performance and sexual orientation (as well as nuisance variables such as body size ([for a discussion see Kaiser et al., 2009^[11]])). Our research will also address the fact that brain-sex-related development is often multi-directional and complex to the extent that different brain regions can develop sex-related differences independently of each other following non-‘normative’ trajectories (see review by McCarthy & Arnold, 2011^[13]; Joel, 2011^[6]; Joel, 2012^[7]). A research approach framed by a concern for a more nuanced understanding of sex/gender opens up the possibility for more directly assessing the relationship between various sex/gender measures (e.g. the Multi-Gender Identity Questionnaire, Multi-GIQ; from Joel et al., 2013^[8]) with regards to data describing brain organization, with particular regard to Kaiser and colleagues’ (2009^[11]) suggestions for MRI research (e.g. tracking similarities, contradictions to established findings, and utilizing direct contrasts). Such a sex/gender-related connectivity dataset also provides for the opportunity of addressing the transdisciplinary challenges implicit in this line of research. As such, particular attention will be paid to the factor method of inferring a regular phenomenology of participants’ subjective sex/gender experience, performance, and conceptualizations in the context of brain connectivity. Such discussions and data offer a meeting point for the scientific community to constructively join in the discourse on the relevance of queer theory and gender binaries in research practice.

*‘Normative’ and ‘norm(s)’ are highlighted throughout the text to indicate the purely statistical emphasis of these terms.

Jared Pool is interested in trans-disciplinary conceptualizations of the brain, behavior, and the individual as situated in cultural contexts – identity, as the locus of the individual for performance and thought is my primary focus. In one project, he’s probing the experience of unexpectedness/anomaly as a situated and non-reductive sociocognitive process and its relation to the expression of identity. He’s also investigating sex/gender in relation to the ‘connectome’ as performance, thought, and brain organization relating to the expression identity.

Daniel Margulies leads the Neuroanatomy and Connectivity Research Group at the Max Planck Institute for Human Cognitive and Brain Sciences in Leipzig, Germany. His research investigates the organizational properties of spontaneous brain dynamics and their implications for individual variability in cognition and behavior -- focusing specifically on the prefrontal cortex. Before entering neuroscience, he studied literature and philosophy, and continues to collaborate with social scientists and historians on questions of the emergence of contemporary controversies in neuroscience.

SEX/GENDER ASSESSMENT IN PSYCHOLOGY, NEUROPSYCHOLOGY AND RELATED EMPIRICAL SCIENCES

DIANA SCHELLENBERG, Technical University of Berlin, Department of Psychology, Germany

Although the current discourse in social and natural sciences indicates that a binary classification into “female“ and “male” may not present a satisfactory method of describing the sex/gender aspect of human variability (e.g., Joel et al., 2013^[8]; Voss, 2011^[20]; Joel, 2011^[6]; Kaiser, 2006^[10]; Blackless et al., 2000^[4]), many empirical studies in psychology, neuropsychology and related fields still rely on implicit definitions and operationalizations of sex/gender. Whether they are assessed using a single check box or more elaborate questionnaires – sex/gender variables are usually some variation of binary or bipolar constructs such as “man vs. woman”, “feminine vs. masculine” or “female vs. male” (F/M). The sheer multitude of studies using F/M-operationalizations suggests that there is an implicit agreement among many researchers that a binary variable assesses some form of sex/gender. However, most studies do not provide the underlying definitions of this variable, and it can be hypothesized that – across and within their respective roles – researchers and participants do not share mutual concepts of “male” and “female”.

My thesis project analyzes contemporary constructions of sex/gender and its assessment in scientific research, explores and develops alternative strategies to binary operationalizations, and empirically tests the validity of these operationalizations against the validity of the traditional F/M-variable. The project is comprised of three phases, and my conference presentation will introduce early findings from the first phase, which involves a thorough literature review and a survey of experts that is intended to assess (a) researchers' rationale behind using sex/gender variables, specifically binary F/M-categories, and (b) participants' interpretations of these variables.

After a brief introduction to theoretical and methodological problems related to categorical sex/gender operationalization, I will present initial findings from interviews with researchers, who have a background in neuroscience (research experts) and persons, who consider themselves to be part of the LGBTQI*¹ community (participant experts). The interviews were conducted in order to validate questionnaires that will be used in the survey of experts. The presentation then links the interviews to a broader scientific discourse by presenting potential biological, behavioral, psychological, and sociological subvariables of sex/gender that are recurrently discussed in theoretical and empirical literature. The presentation is intended to contribute to a discussion about how research protocols in neuroscience can be adapted to reflect queer and social constructionist theories as well as intersectional factors and societal contexts (e.g. racism, classism, ableism) that can interact with and/or impact the expression of sex/gender.

1. LGBTQI* is a commonly used initialism that stands for Lesbian, Gay, Bisexual, Trans, Queer, Intersex. Here, the asterisk represents persons who may not be defined by these initials but do also not identify as heterosexual cis-persons. Here, *cis* refers to the congruence between birth-assigned sex and the gender role a person has adopted and/or been socialized with.

Diana Schellenberg is a PhD-candidate at Technische Universität Berlin. She obtained her diploma in psychology from Freie Universität Berlin, is a former editorial assistant of the Journal of Social and Clinical Psychology and received research training at Freie Universität's Department of Health Psychology and Western Michigan University. Her current research is concerned with the construction of sex/gender in empirical sciences and combines quantitative and qualitative methodology with feminist, queerfeminist, behaviorist and social-constructionist approaches.

PLASTIC BRAINS – FEMINIST MATERIALISM – NEOLIBERAL CONTEXTS : NOTES FOR A DISSENSUS DEBATE

SIGRID SCHMITZ, University of Vienna, Institut of social and cultural anthropology, Austria

The concept of brain plasticity has stimulated debates in feminist neuroscience already for some years. This concept offered important value to criticize neurosexisms (the notion of biological determination of two distinct sexed brains) and particularly to get the gendered constructions of behavior and cognition, of rationality and emotionality, or of sexuality into neuroscientific focus.

However, the use of the brain plasticity concept – albeit extremely useful to point to the inscription and embodying of gendered experiences, societal structures, and cultural norms – also challenges neurofeminist discourse in two ways: First, aren't we in danger to maintain essential concepts, only returning the cause-effect genealogy by insisting on the forming of biological materiality from outside, but maintaining a concept that presumes to predict behavior, thinking and acting then again by this biological entities? Second, does the highlighting of the plasticity concept only follows an approach that refers to the discursive forming of materiality, thus emphasizing the experience based and meaning making processes that are inscribed in the brain, but leaving its agential capacities out of focus?

The current discourse on feminist materialism tries to re-account for the active role of matter, of its agency in the development of worldly phenomena. It is important to notice, that based on the perspective of feminist materialism the agency of matter (including biological and non-biological agents) is not a form of conscious intentionality but a form of enactment that takes part in the realization such phenomena. They come into being via mutual intra-actions between organic, technical and semiotic practises.

I want to discuss potentials and limits of the framing of the brain plasticity concept as intra-active phenomena within a feminist materialist approach. If we understand the becomings of brainbodies, minds, behaviors, social contexts and cultural norms as assemblages in continuous reciprocal interchange, the phenomenon of plastic brainbodies-in-culture may bear the possibility to account for the brain's agency in a non-essentialist manner without disregarding meaning-making processes and societal power relations.

However, at the same time new forms of neuro-govenmentality call for malleable brains to be modulated and optimized with diverse technologies, both from the self and from outside, to enhance competencies and merits on personal and even social level. These approaches are based on on modern concepts of neurodeterminism (cf. Schmitz 2012^[15]) that again refer to the brain's biological essence in explaining and predicting thinking, acting and the self, albeit integration plasticity concepts.

I am strongly arguing for a dissensus debate on these issues (and I will present my approaches to this debate with some examples from my research on gendered neurocultures) that is in my view even more important in times of contemporary neoliberal use, framing and forming of the cerebral subject not only in gendered ways.

Sigrid Schmitz holds the chair of Gender Studies at the University of Vienna. With a PhD in biology (1992) her research and teaching covers Feminist Science Technology Studies since more than 20 years with particular focus in gender aspects in brain sciences and contemporary neurocultures, body discourses in neo-liberal societal changes, embodying concepts, and in feminist epistemologies. 1999-2009 she was university lecturer at the University of Freiburg/Germany, where she initialised and headed the Forum of Competence "Gender Studies in Computer and Natural Sciences" [gin] together with Britta Schinzel. She contributes to the development of didactic concepts for gender studies in SET-disciplines and was visiting professor at the University of Graz/Austria (2003), at the Humboldt University of Berlin (2008) and at the University of Oldenburg/Germany (2009/2010).

Schmitz, S. 2012. The Neuro-technological Cerebral Subject: Persistence of Implicit and Explicit Gender Norms in a Network of Change. Special Issue Neuroethics and Gender. *Neuroethics* 5 (3): 261-274.

Schmitz, S. 2013. Feminist approaches to neurocultures. In *Brain Theory: Essays in Critical Neurophilosophy*. Ed by C. Wolfe. Basingstoke: Palgrave Macmillan (in press).

TESTOSTERONE AS TROJAN HORSE : CONSTRUCTING A FEMINIST AND QUEER BIOSCIENCE WITH SOCIAL NEUROENDOCRINOLOGY

Sari van Anders, University of Michigan, Department of Psychology: Women's Studies, USA

In this brief talk, I will describe my feminist science research program on social neuroendocrinology that disentangles biology from biological determinism and integrates social constructions into bioscience. Social neuroendocrinology is a bioscience that is informed by feminist science and focuses on hormones as dynamic phenomena, simultaneously material and sociocultural. Social neuroendocrinology highlights the malleability of materiality in ways that sidestep nature/nurture debates while still being relevant to them and can be said to 'socially situate hormones'.

I will briefly describe a set of studies that use diverse methods and innovative models for considering social modulation of hormones. I will discuss the implications of these findings for a social phenomenology of testosterone, and their roots in a theoretical model developed to be both biologically and accountable to principles of feminist science. As specific examples, I will discuss how intimate and erotic phenomena affect testosterone in gender-relevant ways. I will discuss how this research complicates notions of biology as reductionist project by identifying how the inclusion of hormones expands and explodes traditional, heteronormative understandings of intimacy. I will highlight the ways that this research attends to gender/sex and sexual diversity in ways that simultaneously trouble their involvement. And, I will make a case for 'gender/sex' as a term that more accurately captures the complex entanglement of social and evolved considerations to bioscience.

Sari van Anders is Assistant Professor of Psychology and Women's Studies at the University of Michigan, and Affiliate Faculty in Neuroscience, Reproductive Sciences, and Science, Technology, & Society. Research focuses on feminist science and social neuroendocrinology, especially hormones and intimacy in evolutionary and social context.

van Anders, S.M. 2013. Invited contribution: Beyond masculinity: Testosterone, gender/sex, and human social behavior in a comparative context. *Frontiers in Neuroendocrinology* 34: 198-210. (and see corrigendum, in press)

van Anders, S.M. 2012. From one bioscientist to another: Guidelines for researching and writing about bisexuality for the lab and biosciences. *Journal of Bisexuality* 12: 393-403.

FROM FACTS TO VALUES : IDEAS OF EQUALITY, DIFFERENCE AND FLOURISHING IN DUTCH DEBATES ON GENDER – SPECIFIC EDUCATION

TIES VAN DE WERFF, Maastricht University, Department of Philosophy, Netherlands

Do boys and girls have different brains? And if so, what does that mean? In public and scientific debates on education – on the lagging behind of boys in high school, the dominance of girls in college or the ‘too feminine’ teaching methods – arguments based on neuroscientific claims have recently come to the fore. Some studies suggest that boys and girls have innate brain differences that influence the development of certain behaviors, including a different pace and style of learning (cf Baron-Cohen, 2003^[2]; Jolles, 2011^[9]; Sax, 2006^[14]). These neuroscientific claims are used in debates about education to promote single- sex class rooms, gender-specific teaching methods and changes in curricula.

How do these brain claims challenge existing norms and values in the field of education? For what reasons, values and ideals is knowledge about gendered teenage brains made relevant? And how does it change the solutions educators think are apt? In contrast with often speculative studies in neuroethics that tend to take neuroscientific knowledge at face value, an empirical philosophical approach can shed light on what actually happens when neuroscientific knowledge enters a value-laden domain such as education, and how the uptake of this particular knowledge can lead to a rearrangement of norms and values, change existing practices and create new goals and ideals. Based on an STS- and moral philosophy informed empirical study on the public debate on brain differences and education in the Netherlands, I will show how factual claims about brain differences between boys and girls become contested, and how nonetheless different inferences of these (contested) brain facts result in both different educational solutions as well as different normative conclusions regarding ideas of equality, difference, flourishing and good education.

Plasticity arguments play a specific role in this normative uptake of neuroscience, as they a) aim to give a scientific ‘grounding’ to our behaviour, and b) at the same time ‘open up’ our brains for all kinds of interventions (cf Abi-Rached & Rose, 2013^[1]). I will argue that neuroscience knowledge, and especially plasticity arguments, are used by both neuroscientists and non-neuroscientists in the Dutch public debate about gender-specific education as an ‘evidence-based’ answer to questions of ethics – specifically regarding flourishing, good education and equality/difference. I will thus explore techno-moral change in action: the co-evolution of science/technology and morality (Swierstra et al., 2009^[18]).

Ties van de Werff (The Netherlands, 1981) is a PhD-candidate at the department of Philosophy at the Faculty of Arts & Social Sciences, Maastricht University (NL). In his PhD project, titled ‘Ethics of a Malleable Brain’, he studies the emergence of the plastic brain as the dominant explanatory model for understanding human malleability, by exploring the normative usages of the concept of neuroplasticity by non-neuroscientists in three public controversies. Besides his PhD-research, Ties is co-founder and curator of a small art collective and a blogger for NextNature (a blog dedicated to exploring the nature caused by people).

THE DISSENSUS OF THE APPARATUS : HOW TO FRAME A META-ANALYSIS OF THE USES AND CONCLUSIONS SURROUNDING THE APPARATUS KNOWN AS LORDOSIS

RACHEL WEITZENKORN, Emory University, Department of Philosophy, USA

Neuroscientists have been on the quest to establish consensus concerning ways to measure the behavioral effects of a wide range of biological variables. Central to the tools available is a, by-now naturalized, apparatus called lordosis. While lordosis is straightforwardly defined as the female mammal's receptive mating posture, it has become a standard tool in a wide range of not-so-straightforward studies on the effects of anatomy, chemistry, genetics, and environment on what can be broadly cast as reproductive behavior. Although lordosis as an apparatus may seem monolithic, reductionist, and dangerous from a feminist perspective, in my presentation I will wonder at the kinds of gender dissensus that emerge from the myriad of studies that use measurements of lordosis to draw conclusions. I will present data from the preliminary stage of a meta-analysis of the uses and conclusions surrounding studies that rely on lordosis. What does the adaptability of the apparatus called lordosis reveal about the dissensus around gender already present in Neuroscience research? How can this dissensus inform a multi-layered approach to gender identity and behavior in Feminist Science Studies? The hope is that by engaging in a detailed study of the assumptions, conclusions and leaps involved in research using lordosis, a more complicated, and topographic picture of the scientific imaginaries about gender will come to light.

The goal of the presentation for the Neurogenderings III conference will be to get feedback on ways to formulate and constrain a meta-analysis of lordosis. I plan to present the preliminary stages of data collection by placing lordosis in a historical context and exploring a sample of the conclusions being drawn through this behavioral measurement. I hope to get expert advice from the conference participants for new ways to frame this inquiry as well as avenues to explore. The question posed thusly in the CFP will be particularly useful for this conversation: which theories, epistemologies and methods are most useful for doing feminist/queer brain science studies? To this question I would also like to add, how can theorists of sex and gender use neuroscience research to broaden and deepen their own tools of analysis?

Rachel Weitzenkorn is pursuing a Phd in Women's Gender and Sexuality Studies from Emory University under the guidance of Dr. Deboleena Roy. While her background is in Neuroscience and infectious diseases, she is currently exploring, through various images of posture, the ways that assumptions about sexuality and desire inform static notions of the normal and pathological body. She engages the literatures of feminist science, queer theory, and histories of science to explore this relationship.

Rachel Weitzenkorn is pursuing a Phd in Women's Gender and Sexuality Studies from Emory University under the guidance of Dr. Deboleena Roy. While her background is in Neuroscience and infectious diseases, she is currently exploring, through various images of posture, the ways that assumptions about sexuality and desire inform static notions of the normal and pathological body. She engages the literatures of feminist science, queer theory, and histories of science to explore this relationship.

CITED REFERENCES

- [1] Abi-Rached, M. Joelle & N.R. Rose. 2013. *Neuro: the New Brain Sciences and the Management of the Mind*. Princeton/Oxford: Princeton University Press.
- [2] Baron-Cohen, S. 2003. *The Essential Difference: men, women and the extreme male brain*. New York: Penguin/Basic Books.
- [3] Biswal, B.B. Mennes, M. Zuo, X. Gohel, S. Kelly, & al. 2010. Toward discovery science of human brain function. *PNAS* 107(10): 4734- 4739.
- [4] Blackless, M., A. Charuvastra, A. Derryc, A. Fausto-Sterling, K. Lauzanne, & E. Lee, E. 2000. How sexually dimorphic are we? Review and synthesis. *American Journal of Human Biology* 12: 151–166.
- [5] Gong, G. He, Y. & Evans, A.C. 2011. Brain connectivity: Gender makes a difference. *The Neuroscientist* 17(5): 575-591.
- [6] Joel, D. 2011. Male or female? Brains are intersex. *Frontiers in Integrative Neuroscience* 5: 1-5.
- [7] Joel, D. 2012. Genetic-gonadal-genitals sex (3G-sex) and the misconception of brain and gender, or, why 3G-males and 3G-females have intersex brain and intersex gender. *Biology of Sex Differences* 3: 27.
- [8] Joel, D. R. Tarrasch, Z. Berman, M. Mukamel, & E. Ziv. 2013. Queering gender: studying gender identity in 'normative' individuals. *Psychology & Sexuality* 1-31.
- [9] Jolles, J. 2010. *Ellis en het Verbreinen. Over Hersenen, Gedrag & Educatie*. Amsterdam: Neuropsych Publishers.
- [10] Kaiser, A. 2006. On 'Geschlecht' in brain science experiments. Conference Proceedings - Thinking Gender - the Next Generation. Retrieved from <http://www.genderstudies.leeds.ac.uk/assets/files/epapers/epaper29-anelis-kaiser.pdf>.
- [11] Kaiser, A., S. Haller, S. Schmitz, & C. Nitsch. 2009. On sex/gender related similarities and differences in fMRI language research. *Brain Research Reviews* 61: 49 – 59.
- [12] Kraus, C. 2012. Critical studies of the sexed brain: a critique of what and for whom? *Neuroethics* 5(3): 247-259.
- [13] McCarthy, M., & A.P. Arnold. 2011. Reframing sexual differentiation of the brain. *Nature Neuroscience* 14(6): 677 – 683.
- [14] Sax, L. 2006. *Why Gender Matters: What Parents and Teachers Need to Know about the Emerging Science of Sex Differences*. New York: Broadway Books.
- [15] Schmitz, S. 2012. The Neuro-technological Cerebral Subject: Persistence of Implicit and Explicit Gender Norms in a Network of Change. Special Issue Neuroethics and Gender. *Neuroethics* 5 (3): 261-274.
- [16] Star, S., & J. Griesemer. 1989. Institutional Ecology, 'Translations' and Boundary Objects: Amateurs and Professionals in Berkeley's Museum of Vertebrate Zoology, 1907-39. *Social Studies of Science* 19 (3): 387–420.
- [17] Swaab, D.F. 2008. Sexual orientation and its basis in brain structure and function. *PNAS* 105(30): 10273 – 10274.
- [18] Swierstra, T., Van Est, R., Boenink, M. 2009. Taking care of the symbolic order. How Converging Technologies Challenge our Concepts. In: *Nanoethics* (3) 3: 269-280.
- [19] Tomasi, D. & N.D. Volkow. 2012). Laterality patterns of brain functional connectivity: Gender effects. *Cerebral Cortex*, 22(6): 1455 – 1462.
- [20] Voss, H.-J. 2011. *Sex in the Making – A biological approach*. Retrieved from http://dasendedessex.blogspot.de/images/voss_2011_sex_in_the_making.pdf.
- [21] Vrecko, S. 2010. Neuroscience, power and culture. In: *History of the Human Sciences* 23: 1.

ACADEMIC PARTNERS & SPONSORS

