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# Beyond Dehumanized Gender Identity: Critical Reflection on Neuroscience, Power Relationship and Law

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## Abstract

The gender movement comprising feminist and queer group movements addressed various issues of prejudices in the legal domain. This article discusses the question of power in the context of neuroscience, gender, and law. It elaborates on how the stereotypical view corresponding to the mythology and parasitic view prevalent in history was made as fact through discourse construction and scientific appropriations. Thus, identifying the simplistic psychology of one's agency, societal framing of the methods of socialization, and institutionalizing the common sense of inferiority about one's identity including the process of internalization along with the biological inferiority has maintained the gap in gender equality. The article further elaborates how gender and self-image have taken a turn with the voices of social change and critical engagement with the reified gender categories.

**Keywords** Attitude · Dehumanization · Gender · Identity · Neuroscience

One of the foremost identity questions is the gender question which is embedded in the power relationship. The long-standing struggle for identity assertiveness has a remarkable influence on various disciplinary domains to see from the gendered lens. Mostly the disciplinary terrains have established models from the Western, educated, industrialized, rich, democratic (WEIRD) worldviews. These dominant male worldviews had occupied various domains and institutions leading to discursive practices affirming this normative benchmark. This lucrative standpoint has become a role model for people in different cultural contexts, at the cost of worldviews of Black, indigenous and people of colour (BIPOC), and other underrepresented subalterns from the global south and East. This has not only occupied the thinking and working of people in the West and global North but also in the Global South. In the context of gender as identity, the reductive approach of binary construction of the categories of gender (Ellemers, 2018) has a near-to-permanent effect. This

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further has centered the stereotypical notion of gender-based categorization in terms of roles, responsibilities, agency and whatnot. On the verge of reducing inequality, it becomes sometimes important to assert the social identity provided how much the person is ready to accept the ascriptions. The gender question is about critical take on the essentializing of the binaries and associated stereotypical approaches of understanding human beings. Since the gendered way of seeing various facets of life including the domains of established institutions is not neutral, the doing of science and its assumptions is also not gender neutral. Looking into the history of knowledge creation in science was mostly male-dominated, imposing and demeaning at the majoritarian level. Neuroscience as a rising star of disciplines is also not untouched by the binaries and gendered way of knowledge codifications. Answers to the gender question, however, may not be sufficient as we can infer through our presupposition how much we are ready to accept our changing contexts. It is also important who is answering and how the answer is taken and understood. Further to the question about gender in general it is also about the historically oppressed gender groups internalizing different gender binaries ascribed to them by society.

The dehumanization of people from marginalized gender groups based on the brain structure is a new form of biologism where the propensity of one's agency to be in a better position is largely reduced with this kind of scientific upheaving. In a society where emotion is connected to gender and there is straight judgment about the authenticity of emotions, for example, interpretations of females and males expressing emotions and the way it is taken as true. The very act of the person injuring the other gets its social shots when it comes to the interpretations and it is quite laden within the available consensus. The way male leaders express their emotions as compared to the female leaders, where chances are high that the former is going to influence the larger audience in the public domain. This is further influenced by the social class of the person which plays an important role in the interpretations of available cues, both neural and social. This may further lead to the inverse process of dehumanization (see Waytz et al., 2010) where people treat humans as animals or objects having positive quality straight away raising the levels of humans when labelled. For example, this woman is like a computer (for example Shakuntla Devi, the famous mathematician from India), or 'this woman is brave like a lioness' or 'this girl sings like a Nightingale' and so on. Sometimes people dehumanize their object of use whom they like, for example, computer, android, vehicle, or in some cases give personhood (for example, assigning a human name) to the pets. In the context of medical examinations, it was noticed that patient whose body x-ray image was seen by the doctor has a less human concern as compared to examination of the computer-generated image along with the patient photographs. Dehumanization having a positive connotation is less than common as compared to derogatory labelling and the possibility of infra-humanization and devaluation.

It is also important to have a self-reflexive outlook from all gender groups to intervene and work on the existing gender questions. For example, the prevalent notions existing about the dominant gender identities extends to various connotations such as "it is in the men's nature to be dominant", "their brain system and its makeup is programmed to be imposing", may reproduce the widely acceptable stereotypical thinking such as "men will be men". However, to be self-reflexive doesn't

systematically override the deep-seated prejudices prevalent in our society unless problematized critically and creating avenues for perspective taking. Whether it is the individual as a starting point of social change or at the policy level, the critique of these gendered assumptions needs to be pulled out from varieties of the domain where neuroscience is not apart. However, it is also not the case that these neuroscientific findings are uncontested when it comes to sex and gender. The context in which people experience that they are highly similar rather than dissimilar, the stereotypically penchant understanding about human agency gets a new all-embracing view of one another beyond the established gender construction. This is also not to decategorize people and portray them as homogenous agency or reject the empowerment one receives through the lifelong movements and social identity meaning making. The presence of gender stereotypes and the prejudices about oppressed gender identity are further substantiated via several DNA and neuroscientific pieces of evidence, which are based on the premise derived from historical stereotypes. In the words of De Vos (2016) “the cerebralization of sexuality leads to a form of desexualization” (p. 131). The way subject matter of the gender gets separated from the brain mechanism, neural activation, fMRI images, indicates how something essentially social and political is at the same time taken as desexualized and as a complex mechanism. Some of the stereotypical views linked to gender showed the institutionalization of roles and characters, together with their ability to deal with their emotion and external appearance. However, in the current times the term stereotype and its established nature itself is under the reexamination. The critical approaches dealing with the category-based stereotypes showed how it is a fluid and mobile phenomenon. The interventions and dismantling the overwhelming situation can immobilize the stereotype-based confirmations. The present article attempts to show in the coming section how neuroscientific interpretation has the possibility to get adapted to the normative construction of gender. The brain does not say anything for itself and it is like a cog in the wheel, where the wheel is the whole system of social life. This article will critically address the four subsections: (a) Gendered brain, (b) Objectifying other’s agency, (c) Gender and identity formation, (d) Dehumanizing brain and identity.

## Gendered Brain

In both the genome and neuroscientific era, it seems that they hold dominance over the interpretations of one’s identity deriving their explanations from the past stereotypes and best fitting in the present. However, the meaning of gender is also simultaneously understood critically and that also passed through different forms and narrations in different forums and contexts. Biologist Fausto-Sterling (2010), critically pondered upon the question, ‘do brains have sex?’. She inquired about the role of biology and society in the making of gender and how ‘gender becomes chemical?’. Further, positioning of gender as Lesbian Gay Bisexual Transgender (LGBT) group and women is a political struggle against gender prejudice. Reduction of people into their gender category requires resistance via the same category to counter it. How can a brain be neutral to gender? If someone is prejudiced based on one’s sex and

socially constructed via the established gender rule, then the positioning of one's identity in one's brain is not science but pseudoscience and completely a prejudice in action against the people of a historically oppressed gender group. As there was major resistance to the neutral-looking scientific theories, the coming of phenomenology shaped through social circumstances has the revival against the dry empiricism and observation from the unquestioned male lens. This majoritarian view often got threatened with new observation and subjectivity from within the neuroscience domain and offered a fresh perspective to critical venture into the established ideas of brain and behaviour. Gender got its armory from the metatheory of critical consciousness and gave a road to venture into the science of humanity. Neuroscience's incapacity to discuss these issues which are very well operating under our nose shows the reductionist stand without any movement which can move the debate further. For example, women's rights activist cannot dramatize their life in varieties of social spaces in a way completely different in a different context, such as a spouse, an activist, a parent, and so on. The criticality towards power structure will intervene in those contexts identifying them as women's rights activists in the true sense. The way we are shaped is a movement of desire, history, politics, and economy. How come the brain is not involved in these processes? Critically, it seems to be the missing picture in neuroscience that doesn't have a proper theory to engage with the future of societal changes. Neuroscience can contest the point of origination of human behaviour, which they deem fit to be in the brain rather than an assertion of the social scientist. The debate continues until a point reached where social context and brain neural firings come together in enriching the accounts of human thought and behaviour.

The interpretation of gender in terms of phylogenetic-biological characteristics of a child in terms of one's own cultural experiences (Cole, 1996) is the marker of deep-seated cultural expressions and common-sense views about the child's sense of his/her identity. This is in one way a folk psychological understanding of others. Keil (1999) aptly stated,

“no one, neither child nor adult can know much of the world in much detail. We rely on a division of cognitive labour that allows us to access areas of expertise in others when we need it” (p. 181).

Brain studies were not without a stereotypical notion about people from different social categories such as gender. Gender is now an interdisciplinary enterprise dealt in both social science, humanities and to some extent sciences, however, it has a deep psychological impact on one's identity. There are two variations in the neuroscientific understanding of the brain, first, the brain structure and functions are universal, and second, brain development is laden with sociocultural interpretations (Rippon, 2019). In both the interpretations of the brain, gender was stereotypically understood and elaborated. The precarious masculinity or manhood (e.g., Bosson & Vandello, 2011) overrides the menace of societal domination. Neural firing is neural activation which is a matter of circumstances in which the human operates, but that is not enough when it comes to gender questions. The current discussion directly addresses the issues of social change by countering the prevalent notions of stereotypes associated with one's gender. How the activities and abilities are associated with one's brain if the person

belongs to a different gender group, can also be addressed by offering a critique of the societal notions about the persons' standing in society. Thus, the self of a person is not hiding behind the brain, or as Paul Ricoeur noted that it is also not embedded in the cerebral fiction about the self which is located within the flesh (see Laughland, 2017). It is not just the brain but the whole embodied agency of humans which constructs the identity. Reliance on thought experiments such as transporting bodies or brain, will not take away the social meaning of the self, formed in the context of collectivity.

The brain is a complex neural system and this observation can be stereotypically observed in the behaviour and thinking of the person, who is also the victim of social situations. The rise of movements and critical consciousness through social activism certainly had an impact on the person and hence the person's brain. The idea is that it is not the brain that decides the survival in the social world but the persons' social activity that survives the brain and categorizes it into inferior-superior, able-unable, logical-emotional kinds of bipolarity is the limitation of the unjust social system rather than anyone's corporeality. The brain itself does not give any firm idea about morality, truth, or falsity but its sophisticated picture aligns with the researcher/judge's schema. The whole concept of morality, truth, mechanism, and methodology seems to have universal standing on authenticity but literature in critical neuroscience and gender studies hints at something as a cultural construction. Thus, gender issues are a universal issue and not a culturally limited phenomenon as understood in traditional cultural psychology. We cannot design everything in the same stereotype as some issues need to be addressed universally, since sub-culture like gender doesn't be limited to the geographical space, and the movement to address this is a global matter. When it comes to the neutrality of the brain as something determining one's identity, it is conceptualized in a narrow sense.

Since the brain is a good receptor of social and political views about one's physical makeup, this systematic appropriation of one's body constructs one's brainhood. Gazzaniga (2005) stated that "you are your brain" and if the brain is historically underestimated one can imagine how the agency and identity of the person are reduced based on the prevalent stereotypical understanding of one's brain. Even the selfhood of the person is taken as something in the genetic makeup and brain essentialism. The way the self is understood in different cultural domains, commonly across the cultures or within subcultures of broader cultural value systems, emanated from the idea of selfhood. The emergence of the science of self-emphasized mechanism of selves deprived it from deeper grounds and linked to the technologies such as functional magnetic resonance imaging (fMRI) for the innovative meaning of self. In the context of gendered selves, the insinuation within the techniques of exploration of selves gave concrete meaning to the prevalent stereotypes in the interpretation and dissemination into the wider social arena.

## Objectifying Others Agency

The objectification of the brain mechanism can be critically reframed from the interpretivist's framework (Dumit, 2004). These interpretations are also laden with the widespread stereotypical notion about the person's agency by associating with the

brain images. There were thought experiments which contemplated the brain in a vat approach. The consequences of brain exchanges on personal identities were one of the major agendas (see Putnam, 1981; Wilkes, 1988). Here the logic takes an alternative turn when it comes to the meaning of brainhood (Vidal, 2009). Ledoux's synaptic self and Vidal's cerebral subject deal with the significance of the brain, where the former is more about the dominance of the primitive over the modern and in the latter the dominance of the modern over the primitive. To elaborate on this, the Ledoux model of synaptic self indicates how the amygdala sends a strong emotional message (e.g., fear) to the neocortex which plays a significant role in information processing and cognition. The amygdala is a primitive part of the brain, has a deep evolutionary capacity to survive animals from perceived and observable threats, and has strongly dominated the brain as compared to the neocortex whose influence is less strong over the amygdala inciting the emotional response. This is like what David Hume<sup>1</sup> philosophy advocated the ethics of rationality triumphing in the context of passion enslaving reason. This latter approach to understanding the brain mechanism may attain two levels of common sense understanding which may further affect the doing of systematic sciences. First, it is the brain evolution that structures the society as it is and second it is the reasoning power of the person and so the brain to change what is stereotypically ascribed to it. If the first level is applied to the gender context, brain essentialism is what derives the basis of one's arguments against gender and social change, for example, if it is the amygdala that regulates one's emotions and the stereotypical assumption that females are emotional which is in the evolutionary design of the person, can also nurture the Gazzaniga's saying that 'you are your brain'. The second notion about the ethics of one's agency to come out of the regulation of passion with one's reason is more liberating and emancipatory as it goes further to the brain essentialism and transforms the meaning of the self, consciousness, and brainhood. Vidal's cerebral subject transformed humans as a cultural modification of the brain, as an anthropological unit. It seems like a presentist's formulation of the emergence of brainhood, a conundrum of self, identity, and biology which is both static and moving, thus, it's perennially modern. Vidal noted that the emergence of brainhood is part and parcel of the history of views about selfhood (p. 11).

According to Vidal (2009) "images are offered as immediate proof that people are different because their brains are different" (p. 24). In the context of brain and gender, the subjectivities that judges hold help in fixing upon the keywords or phrases such as 'women are incapable of controlling their emotions', 'angry female leader being out of control', 'crossing the male domain' etc., may form a punchline for revivalism of assigned categories taken as suitable marker of gender identity. These markers become the cue for decision-making and are spontaneously accepted as a matter of majoritarian consensus. These are the generalizations of imageries people are equipped with, such as imagination of morality, character, body, and society. Even the law is not critical of those imageries which is influenced by majoritarian

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<sup>1</sup> See David (2000 [1748]) *An Enquiry concerning Human Understanding: A Critical Edition*, ed. Tom L. Beauchamp. Oxford: Clarendon Press.



psychology. The work in the fields of brain and cognition has also limited itself to the imageries which have a constricted association with the actuality of context and mediating stimuli. Mead aptly stated that,

“any undertaking predisposes us to recognize and respond to those stimuli which will mediate the act. Psychologically we explain this by the presence of imagery which renders the particular stimulus in question more vivid” (Mead & da Silva, 2011; p. 185).

In the context of gender and brain, the available imageries about people from different groups, as constructed through habits and associations of stimuli, has much affected the correlative evidence which embarked upon the brain and behaviour associations. The studies in the current times in neuroscience are enthusiastically covering various social behaviour<sup>2</sup> of people and their link to the brain. For example, the neural correlates of social selves and perspective-taking in certain situations and contexts (e.g., Zhu et al., 2007). These categories of research have ventured into the gender domain and offered neuroscientific data on the perception of people from different gender groups. This is also the matter of what imageries researchers hold based on their theoretical model and experiences which designed their research and helped in the interpretations which are alternative to the dominant imagery people hold about gender roles and embodiment.

Gender has also a performative role in society and this may add to the categorization of the brain into different social categories. The study demonstrated that the display of organic solidarity led to experienced solidarity among the performers as compared to the display of mechanical solidarity (van Mourik Broekman et al., 2019). Butler (1988, 1989) posited that gender is also an active embodiment that is produced and performed through bodies and language, actions, enactment, and gestures (see Teo, 2015, p. 248). This showed that performance shapes the social structure. In the context of gender and culture, it can be inferred or hypothesized that mechanically situating oneself or adhering to the gender roles shapes brain patterning and hence strengthens the social structure. Various social movements in the context of gender led to the increased awareness and clarity about the self as a biological being as well as a social being, whose connotations have been dominantly controlled in terms of one's biological predispositions only and not as a socio-cultural entity. Thus, the brain is not a neutral and determined force as portrayed in the scientific discourse but is a socially based marker of one's activities. Reducing oneself or positioning oneself and others in the brain system is a narrow way of looking at the social world. Similarly, gender is not neutral positioning of self but a political one and this kind of reduction of humans into different categories is a kind of political activism.

The development of the feminist movement has undertaken all the existing stereotypes from biology to social critically (Henriques et al., 1984). Following this movement against the prejudices of gender identity has also given a critical insight

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<sup>2</sup> Social behaviour, as per Mead (2011), can be ‘readily defined as that which responds to the attitudes and movements of other individuals (p. 185).



into the neutral-looking male-dominated science. The notion that the brain structure determines its content gives a limited account of human agency in the context of gender. This implies a core of cognitivism that is dependent upon the structure and thought. In the case of physical structure, the emphasis on the brain as a marker of one's inferiority or superiority is a misplaced idea and contrary to the agenda of social change. Thus, essentializing neuroscience uncritically is contrary to the reality of the social movement that happened and crossed the boundary of determinism.

Self and body and their changing relationship with new movements and interdisciplinary have challenged the essentialist ideology of fixing categories based on one's history and nature. The mutative line of existence in the context of gender with new inputs of desire, relationships, observations, and dialogues move beyond the essentialized nature of the ascriptive self. This is all happening in the performance and activities and hence loaded in the experiences of the brain. Neuroscientists noted that this self-referential information process activates specific brain areas such as the dorsal and perigenual anterior cingulate cortex (dACC and pACC) in the medial prefrontal region, insular cortex, temporal-parietal junction, the extrastriate and fusiform body areas (EBA and FBA) (e.g., Northoff et al., 2006; Craig, 2010; Blanke et al., 2005; Vocks et al., 2010; see also Majid et al., 2020).

## Gender and Identity Formation

Gender can be viewed from two vantage points, one from the actors' perspective, who is living the gender in both its ascriptive and experienced form and second from the observers' perspective, where someone's physical structure determines the whole gamut of personal identity. In the first case, sometimes the dominant societal notions become more pronounced in the self-judgment rather than the person's own capacity to willingly shape one's identity. Some of the research tried to culminate the understanding taken from interdisciplinarity between neuroscience and social science, the gap remains much pronounced and this compels much of the critical social scientist to ignore brain science in their active discussion of social identity, gender, and bodily self. In the process to rework gender and identity formation, the bifurcation of self as a matter of emergence of consciousness in a variety of contexts can't be separate as it seems. It is the self in the context which situates the sociality of the person. Gender is one's self, as James (1890) stated in terms of, pure and empirical ego. Pure ego is more phenomenological and subjective, however, it may be translated as either perception of the objective world or something qualitatively explicable to the other in the popular vocabularies of society. The empirical ego is what society gives the person, a category, and vocabulary to describe, act and situate in an immediate context. In similar terms gender better equips itself within the periphery of the empirical ego, where social structure and societal norms are embedded in one's roles and activities. The clash between these two egos may be a possibility where the second one strives and thrive over the more inert and subjective one. The enumeration of subjectivities into concrete verbal account may call for a collective understanding of memories and addresses the existing gender-based prejudices through engaging in a social movement. The meaning of gender in these

two ego forms shows that one has the self for which the person may or may not have control, however, the bodily makeup doesn't give a person freedom to change it but the person's perception and attribution may get changed with the alterity and identity intersections. The shifts in the identities and self-demand new avenues of social change where feeling, emotions, perceptions, and consciousness get a new meaning. Ledoux (2002) noted,

“Neuroscientists have been quite successful in figuring out how pieces of the brain puzzle work (perception, movement, learning, emotion) but have not made much progress in putting the pieces together to build the kind of global picture of brain function that would be necessary to understand how one's personal identity, one's self, is represented in neural tissue”<sup>3</sup>.

Further to this assertion, neuroscientists' reductionist account of human behaviour provided an atomist view of human relationships which possibly drove its explanations from the evolutionary theory. In that case, the limited account of identities, both personal and social, were only managed in the brain terminologies which is important and necessary, however, does not cater to the lived-in experience of people which gets translated with new complexities of identities. The prevalent stereotypical connection between the brain and cognitive sciences, without construing that the prevalent gender stereotypes can also be coming into the new science discourses more formally, in the established terminologies to be forced upon or taken by people across the different social groups. The standardization of the gendered way of doing neuroscience is uncritically making its way into the courtroom. Though the series of research in neuroscience contested the stereotypical way of understanding gender, by taking a diverse population into the fMRI scanner, still the neuronal circuits underlying gender identity are unknown (Majid et al., 2020). However, Majid et al. (2020) compared the “brain activation and connectivity in transgender individuals (for whom gender identity and birth-assigned sex are incongruent) with that in cisgender controls (for whom they are congruent) when performing a body self-identification task during functional magnetic resonance imaging, they showed that transgender individuals identified with images morphed “opposite” to their birth-assigned sex” (p.1). They showed that the activation of the self-processing brain network is specific to gender identity rather than birth-assigned sex (p.1).

The developmental theories indicate the universalized mechanism of physical, cognitive, and social development of the child, however, how this development happens in a cultural context and among the diverse group is understated. Law is a designed and symmetrical way of ascertaining rules made through the consensus at varieties of levels. If any debate made by the experts of neuroscience or developmental gets affirmed by the legal community, it creates discourse based on those appropriations, rather than based on critical literature showing the alternative interpretations of data and evidence from the dissensus framework. The Dissensus framework, as stated by Kraus (2012) is “a critical framework centered on the study of

<sup>3</sup> Ledoux (2002). The self and the brain. Prospect. Retrieved from: <https://www.prospectmagazine.co.uk/magazine/theseelfandthebrain>.

conflicts and controversies, including their absence, unsuccessful controversies, etc” (p. 193) (for example, the critical developmental perspective or critical neuroscience perspective). As Kraus (2012) aptly questioned “which is the most important sex organ for gender identity formation in intersex people: their brain or their genitals?” Now, this question can be answered from different disciplinary perspectives. Let’s keep it as biological and social, where biological perspective strengthens its view via physical stature of the person, as what is in the genetic make-up, hormonal and species-typical behaviour. Social view conjures one’s perception of self and identity, social relationships, everyday linguistic display in a social context, group behaviour, etc. The combination of these two perspectives is also possible and some social psychologists showed the importance of integration in the better explanations of identity questions (e.g., Jetten et al., 2012; Matheson & Anisman, 2012; Henriques et al., 1984). Neuroscience, like Krauss (2012), speculated has the potential to enlighten the medical gaze of sexuality and make it more scientific (for example Majid et al, 2020), however, it is more inclined toward the biological side and the brain is the foremost organ to deal with the question of gender identity. The given explanations in neuroscience where the brain responds to different cues in the environment about one’s recognition of gender identity as a social one or a biological one shows an enlightening picture of neuroscience. Some scholars see biological markers as a source to understand the culture (Fausto-Sterling, 2010). Fausto-Sterling noted,

“It seems that in the genomic era biological information holds greater power over identity development than genealogical and historical documentation, or oral and cultural tradition” (p. 168).

The indication is towards the rise of science through genes and neuroscience and attempts to connect them with group membership. From Fausto-Sterling’s (2010) account the DNA and other biological variants such as neuroscience are taken as fixed among the determinist’s circle. There is no doubt that people will be having the same Deoxyribonucleic acid (DNA) throughout and associating it with the group membership such as gender is contrary to the idea of social identity which demands social change. The current literature on social identity and the brain tries to cross over the incompatibility where the former is a matter of shift within the social context with new ideas, the meaning of self, memories, and activities as compared with the brain whose structure is well defined by the neuroscientist as intact. The resolution of incompatibility with a new perspective connects social and identity and the brain as operating in the context holistically. This itself transform the inherent duality that nurtured the idea of the human body and mind through critical philosophical positioning. Even if the perspectives shift, the observations show that human change with time, which gives immense weight to the idea that the future of the brain is not fixed but open new avenues of exploration. The problem with the current account of biology comprising the DNA-based studies of human behaviour is the ‘lack of developmental perspective’ to understand identity formation (Fausto-Sterling, 2010). However, Fausto-Sterling (2010) referred to the researcher who propounded the term gender identity, John Money, who emphasized the high degree of malleability or plasticity in gender identity formation in the earlier years (Money & Ehrhardt, 1972) before it gets fixated with age maturity. Some scholars noted

that it is hormonal influence on the brain that decided the sex of the brain which eventually directs development into male and female gender identity (e.g., Daimond, 2000; see Fausto-Sterling, 2010), however, they do not have direct evidence in the gender identity formation.

Fausto-Sterling (2010) explained this through a study that reviewed the cases of 46, XY children with cloacal exstrophy (a rare birth defect in which infants are born without external genitalia and with other malformations of the bladder and surrounding tissues) (see Byne et al., 2012). These children were assigned and raised as either girls or boys. Most of the patients who were assigned a female identity (33 out of 51) lived as female at the time of the study, however, some are living as male (11 out of 51) and few expressed their wish to become male (7 out of 51) (Fausto-Sterling, 2010, p. 171). It was also shown that 'male raised 46, XY patients, in all age groups, lived as males' (p.171) indicating that data based on prenatal hormones, genetics or other factors do not correspond completely to gender identity, thus, critically debunking the role of full biological determinism. Some studies showed in the post-mortem of male to female transsexuals (MtF) that their hypothalamus in the brain resembled a female which was taken as evidence for the biological cause of this gender identity preference (e.g., Kruijver et al., 2000; Zhou et al., 1995). Lawrence (2010) added to the research substantiating that there is a feminized brain among the MtFs causing their desire to change their anatomy to fit the preferred gender identity, however, earlier these aspects of one's preference were seen under the category, gender identity disorder of childhood (GIDC) of DSM (1980), if observed among children. Among the feminist scholars of psychology, it was an advocate that understanding the body is a need to conceptualize subjectivity, in other words, subjectivity has a prominent relationship with one's bodily self (e.g., Stam, 1998; Bayor & Malone, 1996; cf. Teo, 2015). The subjugation of the body has a direct relationship with the subjugation of self and subjectivity. The demeaning and reduction of one's subjectivity into inferior or superior body structure and brain, reconstruct one's subjectivity either as accepting the social stereotypes towards oneself or forming a rebellion along with the people who are also undergoing similar kinds of emotions. This whole process of acceptance and rejection of ascription as inferior brain, based on stereotypically loaded gender identity shows the power dynamics inherent in the societal structure manifested in the activities and culture of different social groups.

The formation of gender identity can also be the result of the looping effect (Hacking, 1995; see Teo, 2015) where the individual interacts with the assigned psychological categories, form an impression of themselves through the observers' eye and internalize it as part of their subjectivity. Gender identity formation starts with ascription based on sex and the socialization in that direction. Though research showed how the meaning of identity in terms of the ascribed sex and latter realization with new alterity witness the shift in self-understanding, the bodily framework is a prominent marker of one's social identity when it comes to female corporeality. However, gender minorities raised their voice against the politics of ascription, and advocated their will to go beyond the stereotypical labelling, they are more susceptible to epistemological violence, where identity is negatively described and taken as fact about the people from a gender minority group. This countering of the

ascribed psychological categories by gender minorities through social movement is a new way of contesting the given self, in other words, a new kind of psychologizing and reconstruction (Teo, 2015). In the social identity vocabulary, this can be the process of de-categorization, re-categorization, and reconstruction of novel identity due to the felt permeability to the earlier impermeable social boundaries.

## Dehumanizing Brain and Identity

Richards (2009) cited the work of C. Lombroso and W. Ferrero on ‘the female offender’ published in 1895, where he depicted the picture of female offenders reduced to ‘anomalies and asymmetry in cranial morphology’ such as ‘female criminals are hairier, have more warts, less symmetric faces and weightier jaws than their law-abiding sisters’ (p. 263). This was dehumanizing, were reducing them as less than human and making them a victim of epistemic violence. It showed a powerful depiction of stereotypes one holds about others in terms of women’s criminal embodiment making it part of their psyche, further strengthened through the dehumanizer’s confirmation biases. Snatching the agency, disregarding their poverty, everyday humiliations, and brutalities inflicted on these women, was all the medical appropriation of one’s human agency. Law, as a progenitor of societal morality, fell short of that understanding which was needed to provide justice, at least biological justice. The construction and reconstruction of bodily biases created or psychologized the people’s minds with these ascribed categories which acted as a template for filtering out any humanness in the name of a law that considered itself neutral, legitimate, and morally righteous. The difference between primitive and civilized representations (e.g., Moscovici, 2001), seems to be loaded with gender-based stereotypes in the latter than the former. The question which needs to be addressed here is how the advocates of gender summarized male and female psychology and locked it into some fixed binaries. The critical notion which addresses the concern that whether we need distinct male and female psychology (Richards, 2009) must be seen under the new format where identities need to have a balancing view. The assertion of one’s identity based on collective memories is as much needed as the need to see the world from the more improved platform of social justice. The differences and similarities together make the theory better.

Some studies noted the neural correlates of cognitive objectification (Bernard et al., 2018a, b) and how sexualized bodies, body movements, and postures signify the women’s minds and objectification of their agency (Bernard & Wollast, 2019; Lamb & Koven, 2019; Vaes et al., 2011). Bernard and Wollast (2019) noted how “sexualized people are perceived as possessing fewer traits of a human being”. Just by the suggestive posture impression, women were objectified and perceived as less moral as compared to women in the non-suggestive posture. As identity is not a static category but the formed impression through different contexts, both body posture, group affiliation, and routine activities, fix the identity-making the people more vulnerable to prejudices and dehumanization. In the context of the gendered brain, it is also pertinent to look at gender identity within the class hierarchy. In any economy where there are perceived inequalities as well as the true socioeconomic

status differentiation, the biology of the person has a double impact, especially in the case of gender minorities who face the double impact of both sex and the social class-based stereotypes. How the brain of a person of minority gender identity be seen as operating neutrally? In this case, women whose child was prone to schizophrenia symptoms were blamed for their parenting. The coming of biological-neural association for schizophrenia had freed women from the internalization of blame and culpability as schizophrenogenic mothers. But at the same destined her to the grand labelling of being unfit mentally with a deficit brain. This is also one kind of dehumanization in the field of psychopathology where the brain-deficit mother must bear the double brunt of being an unsuccessful mother together with the neurological deficiency. The misunderstanding between biological susceptibility and biological determinism led to several stereotypes emanating out of flawed biology-sociality nexus where cultural factors were hardly accounted for (see Luhrmann & Marrow, 2016).

In the context of understanding other minds, social neuroscientist showed how stigmatized group doesn't elicit neural activities 'necessary for understanding other minds' (Fiske, 2009). Generally, it is embedded in the stereotypical impressions that the capacity to understand others' minds is a human activity and only somebody less than human lacks that capacity. This is a dehumanization tendency to take the brain route to systematically prove that people from a particular group(s) lack the neural capacity to understand the mind of the other. The theory of mind (TOM) approach in which the person forms a cognitive impression and predicts the mind of the other can also be solipsistic. The reliance on consensus may not give the true picture of what one thinks about the other unless complemented with the neuroscience approach. However, the need for radical rationality in the overall attribution and interpretations of the neural activities linked to gender identity may be both relieving and degrading. For example, the interpretations of the women's agency, prescribed activities, and requirement to be part of any institutions such as marriage, through the available legal lens or texts such as different code of conduct (Hindu Code Bill and Sheriya Law) is based on the societal norms constructed in the history through the intervention of dominant group and systematic exclusion of the marginalized and women.

Neuroscience when associated with gender has a greater chance of getting subsumed by the gender-based expressions and interpretations laden with beliefs and culture. Rippon (2019) stated that "so our brains are not just being changed by concrete data about sights and sounds in the outside world, or by very specific experiences and events, they are actually absorbing and reflecting the attitudes and expectations of those around us" (P. 140). Though these attitudes and expectations work differently for different gender groups. They operate both dispositional and contextually depending upon the social category positioning in the society. Harris et al. (2005) noted that other person's perceived disposition is one of the frequent reasons for the prediction of behaviour and action as compared with the social norms. This was further validated through brain studies where activation of brain areas such as the superior temporal sulcus (STS) and medial prefrontal cortex (mPFC) happened during the low consensus conditions. These areas of the brain are responsible for the attribution of others' dispositional characteristics such as unique



attitudes, personalities, and idiosyncratic intent, in a high consistency situation. In the cultural context where patriarchy shapes the dominant value system, attribution towards marginalized gender groups is more towards the inner psychological disposition such as character and traits. Here the latent distribution of prejudicial intent operates in a subtle manner against the marginalized gender group, though its outward manifestation, as it was seen in implicit stereotyping studies, where social behaviour was found to be operating implicitly and unconsciously (See Greenwald & Banaji, 1995). Some of the studies showed how gender stereotypes are implicit, for example, essays having male author names were judged more favourably than the female author's name (Goldberg, 1968). This is possible with other gender minorities like authors from LGBT groups. Greenwald and Banaji (1995) viewed that this kind of judgment shows a gender stereotype that categorizes males as better achievers than females.

In other studies, it was noted that the mere presentation of traits (e.g., aggression vs. dependence) categorized people as male or female showing how implicit stereotyping is automatically manifested in the behaviour and action (Banaji et al., 1993). This is quite evident in our everyday life where we engage in mini-experiments to test our and other's behaviour and even if these establishments of cause and effect are not so laboratory-based, we get the sense of ourselves and others about the characteristics, behaviour, stereotypes, and the way anyone is dehumanized. We have witnessed both false alarms and hits when we feel our cognition congruent or distorted by our preconceived notions about others. It seems like the prejudice people hold against the marginalized, if not made conscious (as was shown in the experimental studies), they express it in the form of behaviour, as a kind of discriminating act. If made conscious or asked to focus on their activities, the chances of implicitly falling into discriminating action may be reduced. Since there are many kinds of social groups in our society and are emerging in different permutations and combinations in different situational contexts, it becomes hard to be linearly focused on one's attitude towards a different social group. Unless their social position, status, and history are mobilized in the form of public discourse through the different channels, it will be limited to the experimentations in the laboratory. Culture and biology may form a unique discursive combination that has a direct effect on people's social relationships.

In one of the studies on dehumanizing representations of women, Tipler and Ruscher (2019) suggested that the "continued transmission of animalizing metaphors for women may help perpetuate prejudicial beliefs about appropriate roles for women in society" (p. 109). These animalizing metaphors which animate from the social structure led to dehumanization and dementalization where the former degrades the human agency to animals and the latter involves the denial of a person's human essence, nature, and experience (Gray et al., 2007; Haslam, 2006; see Tipler & Ruscher, 2019). In one of the neuroscientific studies, Cikara et al. (2011) observed that participants with high hostile sexism scores elicited less activity in brain areas responsible for social cognitive processing and mentalizing, that is, medial prefrontal cortex (MPFC), temporoparietal junction, praecuneus/ posterior cingulate, superior temporal sulcus, and temporal poles (see Frith & Frith, 2003; Mitchell, 2008) in comparison as compared to sexualized men or clothed women (P.4). This showed how the context and way of seeing gender stereotypically can result in dehumanization.



Though Tipler and Ruscher (2019) noted that there are “no gender differences in the impact of animalizing metaphors on attitudes towards women” (p. 111), it also matters how people internalize the social system and adopt the patriarchal gaze in the process of assigning meaning to the others agency. So, it is also a matter of adopting a critical gaze at the collective level to counter the already acquired and ascribed worldview about seeing the marginalized identity or countering what was internalized by annihilating the given marginalized identity. It is observed that the movements against the rigid gender hierarchy had led to the changing discourses and gaze towards the marginalized self and others.

## **Conclusion: Brain, Gender, and Social Change**

To develop a better space for understanding, this dehumanizing tendency, and other marginalized groups such as women and people from other binary groups have a grave consequence for them as compared to a similar kind of labelling used for the dehumanization of males. In the former case, it creates the emotion of shame and humiliation, and in the latter case aggressiveness and anger. Though this kind of dehumanization creates aggressive emotion among the female group also its manifestation is within the ambit of humiliation and suppressions. What neuroscience can do about gender-based dehumanizing and how the law may intervene to eliminate these forms of derogation and objectification of minorities and marginalized gender groups? There are suggestions to counter one’s deep-seated biasedness against the minority, which has both neural intervention and social one. The strategies to enhance the ACC-mediated conflict monitoring process along with the consciousness directed towards the cues that facilitate the control (e.g., Kleiman et al., 2014; Monteith et al, 2002; cf. Amodio, 2014; see also Fiske, 2009). What about the intervention to address the implicit biasedness and expression? These strategies are predicted to control the implicit stereotypes but the chances of the sleeper effect cannot be denied as the person from a dominant group such as male may encounter biased kind of mobilization from peers, media, or everyday encounters rigidifying the once diluted prejudices. The best strategy is the facilitation of social movement and encouraging the critical alterity from the gendered group such as women and LGBT enhancing everyday dialogue which has the potential to counter the prejudice in a better way. Thus, positive intergroup contact fosters a sense of inclusiveness and the construction of new social identities (Reimer et al., 2022).

The strategies to counter neural dehumanization of the marginalized need to be corrected at the perceptual level (see also Thyberg, 2019). The social cognitive mechanism is linked to vmPFC which becomes active when the persons’ self is congruent to similar others. The dissimilar others activates the dmPFC and this may be response in the case of stereotyped, excluded, and neglected identities who confronts the powerful. The brain is programmed in the social context and everyday socializations. The rise of resistance and meaningful dialogue has a remarkable impact on the brain, indicate that the brain is social. This is possible with the enactment of pro-diversity, and unconditional acceptance of a person from a marginalized gendered

group. Even the like-minded group of people who challenge social ostracization based on gender may reach up to the level of amelioration, instead of complete social change and transformation. This poverty of understanding and accepting others may fail the agenda of construction of a common identity. The effort to bring the element of inclusiveness is sometimes the same as bringing change but on the terms of the dominant group unless overhauled through what Shotter (2011) called emancipatory positioning of the self. It is in 'embodied anticipation and expectations' through which we integrate our understanding of the world. Shotter called this an 'orientational' understanding. If this understanding of the social world brings incongruency in the self, the chances are high that the self is marginalized and has located itself within the ambit of dominant values. The congruency of the self with the external world is inviting, emancipatory, and liberating in a '*way of being in the world*' (Shotter, 2011). The hardest part, however, is to crack the deep-seated worldviews that have occupied the mind of society. All the new efforts to bring change in the mindset and attitude against gender prejudice that is not fact, except the prejudice itself, gain fuel from the different dominant perspectives that had directly formed associations with the actions and observations in various social domains. For example, subjugation of women in the families in various forms, in occupation, and everyday interactions gives a prejudiced high for the dominant groups.

The association of subjugation of women to evolutionary theory (see Fausto-Sterling, 1992) and substantiating with the quirky observations and populist theory on smartness, superiority and inferiority of genes, uncontrollable hormones, physical fragility, and size of the brain, has no doubt dehumanized this marginalized gender group and kept them below the standard of a human beings. Gender is a human-made construct and can be construed as either natural or social. The images of a different gender can be an emergent phenomenon based on social stereotypes and socialization. The category-based bias and stereotypes are the main regulator of judicial activism and all the corrections are made in terms of new ways of social construction. It is not in the natural body but in the perceptions where the activism has the maximum impact. Whatever is the philosophy to know something in the sensible environment, whether conceivable or not, empirical, or perceptual, gender is understood through the integration of what is happening to one's presence in the external world and the perceiver's knowledge about it. This connection is non-linear and mediated by the accumulation of experiences. The notion about the object or its existence in the social world directly observed via the senses of the observer has limitations and they seem to deny the ground on which these observations or quality exists (see also Smith, 2004). The annihilation of self which is oppressed, ascribed, and insinuated with the dominant societal influence such as toxic masculinity, rejuvenates the brain from all the toxicity and generates a new identity and self. Why in the case of male and female relationships, males blame their brain which seems to be controlling one's will to respect their wife, and why the female is considered to be easily persuaded, have an emotional brain and expected to have an agency which will embrace everything from love to humiliation. And further why any kind of rebellion or assertion from the females is seen to be in the inferior positioning of the brain which doesn't understand the meaning of relationships, which is expected from her. Is it like that our brains are programmed in such a stereotypical manner?

Morality may encompass one of the behavioural components as ‘telling the truth’, as a matter of one’s will, morality may also not deny ‘telling the lie’, for altruistic purpose or greater good.

For law, as its universal and ideal picture portrays, the first component of morality is better, legitimate, and pro-societal. The second aspect does not legitimize itself under the periphery of law and there is no willingness to affirm the need for law for the greater good as it neither looks rational nor worthy enough to fit into the status of law. It was pointed that Kohlberg’s (1981) approach in which he showed moral reasoning and normative judgments are rooted in the cognitive-developmental models. It is quite established that cognition emerges from the context and it is also a matter of cultural construction (see Hepburn & Wiggins, 2007). The assumed linear relationship between identity and cognition is taken as insufficient in explaining one’s social behaviour. Similarly, the linearity between moral development and cognitive development is not sufficient to generalize. As Kohlberg based his study on male participants, the understanding of morality and ethics from the gender perspective was missing (see Muuss, 1988). Generalization of the process of morality in all the groups may be a limited approach, though the brain area shown to be active through scanners may show overlapping pictures when the person is engaged in higher mental processing. Some studies showed how truthfulness does not engage higher mental processes as compared to lying and deception, however, morality as per its definition is not the same as telling the truth. Telling the truth or not hiding any information when probed can have two kinds of mechanisms of understanding, one where the researcher tests the knowledge in an experiment with the help of fMRI or some criterial evidence such as assessment of galvanic skin response and second through the filtering of information by the available cultural templates. In both cases, truth doesn’t change but is methodologically determined when something hidden is expressed through some channels and approved by the truth seeker. Culture is not limited, for example, masculinity with its feature which determines its essence may align universally. Gender has a moral basis and gender-based oppression across the culture shows its oppressive tendency of this kind of culture.

**Abbreviations** fMRI: functional magnetic resonance imaging; LGBT: Lesbian Gay Bisexual Transgender; dACC: Dorsal Anterior Cingulate Cortex; pACC: Pregenual Anterior Cingulate Cortex; EBA: Extrastriate Body Areas; FBA: Fusiform Body Areas; DNA: Deoxyribonucleic Acid; XY/XX: Sex Chromosomes; MtF: Male to Female Transsexuals; GIDC: Gender Identity Disorder of Childhood; DSM: Diagnostic and Statistical Manual of Mental Disorders; STS: Superior Temporal Sulcus; mPFC: Medial Prefrontal Cortex; vmPFC: Ventromedial Prefrontal Cortex; dmPFC: Dorsomedial Prefrontal Cortex

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