

The Impact of Neurophysiologic Development on the Regulation and the Management of Homosexual Impulses²

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Abstract

An understanding of central and autonomic nervous system (CNS/ANS) development is foundational for understanding many human behaviors. The purpose of this article is to explore challenges to the development of these systems and the impacts of these challenges on behavior, specifically on the development of gender identity and same-sex attraction. In situations of good-enough development, the CNS and ANS work in a coordinated effort to manage environmental input (audio and visual) to maintain a *steady-state*. When development of the CNS and ANS are inadequate, the individual can face challenges in managing auditory and visual input and experience an accompanying need to act in some way to restore balance. This article hypothesizes that the developed inability to manage visual, auditory, and other sensory input is a key factor in individuals suffering from unwanted same-sex attraction issues. Learning to modify or even avoid disruptive sensory inputs is helpful in overcoming some of the negative outcomes associated with the development of these—and any other—unwanted behaviors.

Introduction

A bio-psycho-social model of development has been proposed as the best current explanation for understanding how persons come to experience SSA—homosexual (same-sex) attractions (American Psychological Association, 2008; Byrd, 2008). As a biomedical scientist who leads a support group for men dealing with unwanted SSA, I have found that there is a need to demystify the nature and origin of homosexual impulses. Group members have found it helpful to understand that same-sex impulses are in and of themselves morally neutral inputs to (stimulations of) the central nervous system (CNS) through the brain’s limbic structures and connections of the limbic structures with the autonomic nervous system (ANS).

Visual and Auditory Stimulation May Influence One’s Actions by Impacting the CNS

The ANS is comprised of the sympathetic and parasympathetic nervous systems. These systems allow the body to regain its accustomed, familiar level of body tension or activation—in other words, its steady-state regulation. It does this either by revving up the body (the sympathetic branch causes the body to become more “aroused” and ready for possible reaction) or calming down the body (the parasympathetic branch causes the body to be less aroused and more comfortable with not reacting) (Guyton, 1991; Schore, 1994). Overall, these systems work to maintain the emotional and physiological balance of the body (Carroll, 2009). In other words, sensory inputs or arousals perceived as pleasant or unpleasant to the body are managed by the various nervous systems.

Stimulation and regulation of the CNS and ANS are in one sense influenced by, but in another sense independent of, the meaning—including the “moral” meaning—of any desire, impulse, thought, imagination, memory, or appetite, including sexual appetite. On the one hand, one cannot escape the physiology of the body. For example, in times of stress,

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strong stimulation of the sympathetic nervous system provides extra activation—mass or body-wide arousal and a need for discharge of energy—in order for the body to perform far more strenuous physical activity than would otherwise be possible (Guyton, 1991).

In and of themselves, physiological (neurologically reflexive) impulses have no moral significance, but they may lead a person to act in ways that are morally—consciously, cognitively, and volitionally—significant (Guyton, 1991; Schore, 1994).

As mentioned, the sympathetic nervous system revs the body up and the parasympathetic calms the body down (Carroll, 2009; Guyton, 1991). Inputs to these nervous systems come in many different forms. Visual and auditory stimulation have a profound impact on the immediate and long-term structure and function of the nervous system (Schore, 1994). Sights and sounds—as well as touches, smells, and tastes—are internalized as memory; however, they are also internalized as nervous system structure (Schore, 1994). Chronic activation of the limbic system may lead to structural changes in the circuitry of the nervous system—the growth and habitual, coordinated stimulation and functioning of relevant nerves. Such chronic activation is significant, especially if traumatic interactions occur during critical periods when the CNS is developing (Schore, 1994; Schore, 2003a).

Problems can arise when sympathetic and parasympathetic systems become imbalanced due to the chronic activation of the limbic system (Schore, 1994; Schore, 2003a; Schore, 2003b). In these instances, structural problems—for example, neuronal development and habits of arousal or the lack of arousal—may become part of the architecture of the brain (in other words, become “hard-wired”) and may inhibit or suppress future functional areas of the limbic and autonomic nervous systems (Schore, 1994; Schore, 2003a).

For example, the sympathetic nervous system may dominate the parasympathetic (or vice versa), leading the body to become chronically or typically over- (sympathetic) or under-(parasympathetic) stimulated. This would lead to a child’s

inability to maintain a physiological steady-state, which in turn leads to physical and/or emotional “discomfort” (Carroll, 2009; Schore, 2003a). In effect, the CNS cannot then function optimally because of its challenged architecture (in other words, the habitually over- or under-stimulated nerves); therefore, the child’s nervous system becomes inefficient at metabolizing visual and auditory input. In other words, the child becomes over- or under-aroused by what he or she sees and hears (Schore, 1994; Schore, 2003b).

Inhibited Structure-Function of the Nervous System

Inhibited structure-function of the nervous system can begin to develop during infancy (Schore, 1994). This means that an infant who experiences too much or too little stimulation may develop chronic difficulties in how his or her brain and nervous system function. For example, when an infant’s excitement (sympathetic arousal) is met with indifference or disapproval by a parent, the child may respond with parasympathetic activation that is experienced as a downward fall into shame, grief, disappointment, and/or guilt (Carroll, 2009; Schore, 1994).

If this mode of communication is reinforced by continued perceived parental rejection, the child’s sympathetic structure-function—his or her ability to become excited—may become inhibited. If this happens, the child’s parasympathetic structure-function—his or her ability to reduce or avoid physiological/emotional arousal—may become the child’s dominant regulator or arousal (Carroll, 2009; Schore, 1994). As mentioned above, if a child’s physical and emotional arousal are subject to excessive, habitual parasympathetic control, then his or her emotional life will be dominated by feelings such as depression, shame, grief, disappointment, and/or guilt.

It is important to understand that structural changes in the ANS—such as habitual patterns of nervous arousal—originate in the limbic system (Schore, 2003a). The limbic system is the part of the brain that responds to all external stimuli, but especially to any stimulus—sight, sound, touch, and so on—that is perceived as a threat, such as the loss

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of a valued experience or the threat of an aversive experience (Guyton, 1991; Rothschild, 1998; Schore, 2003a). If the child is unable to escape a threat (for example, the separation from his or her mother as in cases of hospitalization), the limbic system may respond with the parasympathetic response of freezing or dissociation (Rothschild, 1998; Schore, 2003a). Bowlby (1960) described this type of behavior as a response in a child who was separated from his mother during hospitalization; the child went through a sequence of behaviors observed as protest, despair, and detachment.

The freezing or dissociated response is mediated by the secretion of hormones involved in the response to a perceived threat. The CNS stimulates hormone secretion from the endocrine system (Guyton, 1991; Morris, 2004; Schore, 1994). Endocrine regulation is a major function of the limbic system and has a long-lasting influence on CNS growth and development (Guyton, 1991; Nolte, 2002; Schore, 1994). If perceived threats persist, the absence of normal hormonal regulation during critical developmental periods causes permanent physical changes and profound structural anomalies in the limbic system and the ANS (Schore, 1994; Schore, 2003a). When a child's limbic system is using its resources to defend against threat, there may be too few resources left for his or her growth and development (Lee, Ogle, & Sapolsky, 2002; Sapolsky, 2003).

During times of extreme threat (for example, a prolonged or even brief stay in the hospital), the child's limbic system sacrifices the secretion of hormones that stimulate growth in exchange for the secretion of hormones that protect the individual against threat—such as those that help the child deal with the aversive arousal of separation from his or her mother (Bowlby, 1973; Sapolsky, 2003). If the infant otherwise survives the threat (for example, endures the separation from his or her mother), an overall negative consequence of this experience can be a lack of development of sufficient neuronal connections between the CNS and ANS that may appear as a parasympathetic over-activation (depression) as the child continues to develop and mature (Sapolsky, 2003; Schore, 1994; Schore, 2003a). In this scenario, the parasympathetic nervous system

becomes the dominant peripheral nervous system regulator. In layman's terms, the child develops an inordinate need for emotional "self-soothing" to ease the uncomfortable, parasympathetic overactivation.

A Compromised Ability to Differentiate One's Gender

During critical developmental stages of the infant nervous system, other CNS structures and functions may be inhibited or suppressed. Since gender identity is also developing during infancy, the neurobiological structures that impart a sense of one's gender may also be inhibited by experiences such as separation anxiety between a child and his or her mother. Traumatic interactions during critical developmental periods may damage the developing structural links (neurobiological circuitry) between the brain (CNS/limbic system) and the body (ANS) so that a child's sense of his or her gendered body is challenged or even lost. In this situation, the primary and secondary characteristics of gender (in other words, male/female sex) are intact—biological males look like men, and biological females look like women. But what is challenged is the child's—and if it persists, the adolescent's and adult's—ability to differentiate gender (male/female) in his or her own ANS (in other words, in his or her body). In such situations, a neurological/physiological sensory deficit has developed. This may be caused by the suppression or death of neuronal circuitry between the limbic system and the ANS.

Another cause of such a neurological/physiological sensory deficit may be a compromised limbic system. In addition to functions described above, the limbic system controls reproductive behavior (Aggleton, 1992; Guyton, 1991; Sapolsky, 2000). Changes in the limbic structure due to traumatic stress may potentially leave the infant with an inability to differentiate his or her gendered body. Dissociation from one's body becomes a function of neuronal death or suppression due to traumatic interactions—for example, experiencing an inadequate attachment to one's caregivers—on the developing CNS and ANS (Schoore, 2003a). The infant is fundamentally left "body-less" with respect to gender

identity because of structural changes in the traumatized CNS and ANS. Bowlby (1969) hypothesized that some neurological impairments caused by separation anxiety may have varying functional consequences that range from total absence to dormancy, in which the underlying structures are partially or completely developed yet remain nonfunctional (Bowlby, 1969). If gender is in—and of—the body (ANS) and if one dissociates from one's body, then one's sense of gender identity can be irrevocably impaired.

How Immature and/or Nonheterosexual Arousal May Develop

A potential arousal and behavioral consequence of this type of impairment of gender identity may be that the infant will learn or imitate gender characteristics from the closest body to it, usually the mother. This may account for the preponderance of cross-gender behavior seen in prehomosexual male children (Green, 1975; Zucker, 1992). As these children reach physiological sexual maturity, the capacity for reproductive behavior (copulation) remains intact, because reproduction is bound to survival behavior, which is also a major function of the limbic system (Sapolsky, 2003). However, the absence or inhibition of certain neuronal circuitry between the brain (CNS) and body (ANS) may leave these individuals with the inability to differentiate not only their own gendered bodies, but also other objects of reproductive significance—in other words, whether one is sexually attracted to a person with a body whose gender would allow reproductive copulation.

This confusion of reproductive objects may manifest itself as attempts to copulate with objects of the same sex, immature objects of the same or different sex, and even inanimate objects. This type of behavior has been demonstrated in animal models and is known as the Kluver-Bucy syndrome, a syndrome in which cell death in specific areas of the limbic system produces atypical copulation behaviors (Aggleton, 1992; Guyton, 1991). This type of confusion may likely be the foundation for homosexual feelings and behaviors in humans.

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One consequence of this type of CNS/ANS derailment is that individuals have difficulty processing visual and auditory cues of their gendered self. What he or she may interpret as sexual feelings is really a lack of synchrony between the CNS and ANS. For example, visual input—such as a picture of partially clad males—can lead men who experience SSA to experience “emotionally unbalanced” or overactivated parasympathetic arousal. Instead of perceiving the visual input and subsequent arousal as an indicator of CNS and ANS detachment, a man may interpret this stimulation—or himself—as intrinsically “homosexual.” Such an interpretation is unfortunate, because it confuses or mystifies the underlying causes of any subsequent same-sex “reproductive” behavior, as well as the person’s self-identification.

Understanding and “Neutralizing” Homosexual Feelings

Some people who experience “homosexual” feelings (same-sex attraction) would rather not. Regardless of whether one wants to experience SSA, persons with SSA may find it helpful to understand such feelings as a challenge to—in other words, a need for—CNS/ANS steady-state regulation. Using the example above, when a man sees a picture of partially clad males and experiences homosexual arousal, it is possible for the man who is aroused to understand how this visual input has affected his nervous system. If and when he is able to see such input and subsequent arousal as a challenge to his steady-state regulation, he is able to neutralize—in other words, normalize or render understandable and commonplace—this visual “input” and the subsequent arousal. Put simply, he can see the same-sex arousal for what it really is—and isn’t.

This neutralization—or proper understanding—of visual, auditory, tactile, and other stimuli transforms the input from a “purely” sexual stimulus to an impulse that must be discarded and/or digested (processed) by the CNS/ANS. In this light, the input may come to be understood as not really a sexual cue but a “reflexive” indication of the asynchrony—functional imbalance—between the CNS and ANS. However, the power of

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the input (the external stimuli) cannot be underestimated because the processing of the input is bound to the survival behavior of reproduction.

It is important to emphasize that the homosexual “reflex” (SSA) is not about someone else’s body, but about one’s own—in other words, the CNS/ANS disconnection in one’s own body. This disconnection is part of the ever-present, ongoing functioning of the central and peripheral nervous systems and how these systems are accustomed to metabolizing (processing) input from the environment. Just as some foods may give a person a stomachache, some stimuli (such as visual nudity) may give someone’s nervous system an overwhelmingly uncomfortable physiological challenge, such as arousal in need of calming or other resolution.

A key ingredient to maintaining steady-state regulation, including reacquiring a measure of internal comfort or peace, is to discard stimuli that we have experienced that can negatively impact steady-state regulation—in other words, that can leave one tense or otherwise uncomfortable. Continued exposure to some stimuli reinforces the positive or negative physiological and emotional consequences on the CNS and ANS, maintaining and/or intensifying one’s physical and emotional arousal. Lessening the exposure to such stimuli has value in decreasing physiological discomfort. A teacher once said, “If the eye offends thee, cut it out and throw it away” (Matthew 5:29). Of course, it may be easier to just avoid (as much as possible) stimuli that have a powerful negative impact on one’s nervous system regulation than to stop attending to the stimuli. For example, it may be easier to never look at stimulating pictures than to stop looking or recalling what one looked at. But ceasing to look as well as never looking to begin with are both possible.

For persons who find homosexual feelings troublesome, the mere avoidance of stimuli (such as pornographic pictures or videos) that impact the CNS and ANS in a negative way can be extremely helpful to maintaining steady-state regulation. However, keeping oneself physiologically/emotionally calm may require further vigilance, such as

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learning to be more cautious about activities as simple as going to the grocery store or spending a day at the beach. Maintaining and restoring steady-state regulation is the goal.

My group members' overall goal is to lessen the impact of all challenges to their steady-state regulation—in other words, experiences of SSA resulting from visual and auditory stimulation—by reducing or limiting such stimulation. In doing so, they hope to learn how to return to a more physiologically and emotionally balanced (less tense and more comfortable) state.

Group members also have found it helpful to recognize the potential root causes of their SSA. Realizing, understanding, feeling, and dealing with emotional trauma that they experienced early or later in their development appears to have a profound influence on gender identity for some of the men. It appears that my group members' efforts to intentionally become aware of the consequences of these traumatic life experiences have enabled the CNS of some of these men to rebound from this trauma. In general, the men in my group have been helped by understanding their experience of SSA in this way.

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