

Gender Identity Development in Adolescents: Social and Biological Influences

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Abstract

Gender identity development is a vital component of adolescent mental development driven by complex social and biological factors. This paper discusses current theories and empirical research that have shed light on the adolescent developmental task of transitioning to gender self-concept. The research collates evidence on factors such as family, peer, school and media influences, as well as genetic, hormonal and neurodevelopmental influences. Emphasis is placed on the interplay of personal feelings, social interaction, and biological trajectories, with implications for support and intervention strategies for gender-diverse youth.

Keywords: Gender identity, Adolescence, Social influences, biological factors, Gender dysphoria, Gender development

Introduction

Adolescence represents a crucial developmental period during which individuals form a clearer and more stable sense of self, and gender identity emerges as one of its most significant dimensions. Gender identity refers to an individual's deeply felt internal experience of being male, female, both, neither, or falling elsewhere on the gender spectrum. During adolescence, young people undergo rapid cognitive, emotional, and social transformations that shape how they understand and express their gendered self. The process is not linear; instead, it evolves through negotiation of personal feelings, bodily changes, societal expectations, and interpersonal interactions. Social environments—such as family, peer networks, school culture, media exposure, and broader cultural norms—play an essential role in guiding or constraining the exploration of gender. Supportive communities can foster healthy identity formation, whereas rigid or discriminatory environments may create confusion, stress, or suppression of authentic self-expression. Thus, gender identity development is closely tied to the social contexts in which adolescents grow, influencing both their psychological well-being and their sense of belonging.

In addition to social factors, biological influences significantly contribute to how gender identity forms and stabilizes during adolescence. Puberty triggers hormonal shifts and visible bodily changes that prompt adolescents to re-evaluate their relationship with gendered expectations. Neurobiological research suggests that the brain's structure and functioning, shaped by both genetic and hormonal factors, contribute to individual variations in gender identity. For some adolescents, the alignment between their experienced gender and their biological sex feels natural, while others may experience incongruence, leading to questioning or redefinition of their identity. These

biological factors interact dynamically with social experiences, meaning neither works in isolation. Understanding gender identity development in adolescents, therefore, requires a holistic perspective that acknowledges the interplay between social influences and biological processes. This integrated approach allows educators, parents, healthcare providers, and policymakers to support adolescents through a sensitive and complex journey toward authentic gender self-understanding.

Social Influences

Family & peer group influence: Family, and peer groups, are key factors of gender socialization. Family and peer groups are the most important forces of gender socialization. Parental support is associated with positive mental health and positive gender identity development in gender-diverse teens. Families are the initial and frequently strongest instigators of gender socialization. Parents are the most influential force in the development of gendered expectations and behaviour from the time of birth - through role modelling, verbal signals and by direct reinforcement. Gender stereotypes, parenting styles, as well as parent attitudes, provide children with an opportunity to learn and embody gender roles. Adolescents say that a family that supports, nurtures autonomy and encourages authentic expression results in high self-esteem, and increased confidence developing gender identity. In contrast, inflexible or conventional family systems may continue stereotypes and push children to conform, contributing to psychological distress, especially for gender-diverse youth. Peer groups become more influential during adolescence, when they learn to adopt the norms and values of their friends and classmates. Peers commonly enforce strict gender roles as well, forming strict social barriers to all behaviour and choices of interest related to gender. Adolescents who break those norms — such as boys with feminine interests or girls who turn to boy-typed hobbies — risk teasing, exclusion or social pressure to conform. Studies of peers from all ages have shown that peer networks play a highly potent role in shaping attitudes toward gender, not just what is normal, but also how happy and satisfied one is with one's gender identity.

School & media influence:

Schools and media promote or contest gendered expectations and can facilitate affirmation and discomfort among adolescents who are exploring gender identity. Teacher expectations, curriculum resources, class curriculum, classroom instruction, and classroom interaction can either reinforce gender diversity or support traditional gender identities. Stereotypes-contradictory and progressive educational environments promote inclusiveness and critical learning and enable students to discover more and more paths to gender diversity. The media also permeates in the popular culture, advertising and social media — where messages about what's acceptable in terms of gender take the form of advertising and messages (for example, through pop culture, social media) which adolescents consume. Depending on the content, these portrayals may further reinforce stereotypes or create an avenue of inclusion and affirmation.

Community & Societal context: Adolescents' experiences of gender are shaped through interactions and feedback from their surrounding communities, which can affirm or challenge their emerging identities. The broader social environment, including cultural and community norms, shapes how families, peers, schools, and media operate as agents of gender socialization. Societal beliefs about gender fluidity or rigidity affect adolescents' experiences of affirmation or marginalization. Supportive communities encourage diversity and identity exploration, while restrictive cultures may stigmatize nonconformity and reinforce binary ideas about gender.

Biological Influences

Biological factors like prenatal exposure to hormones and pubertal changes have an important role in gender identity development. There is evidence for differences in brain architecture and function in gender-diverse youth, presenting a neurobiological factor. Prenatal hormone effects strongly direct aspects of both brain and behavior that play a role in gender development. Children with congenital adrenal hyperplasia (CAH) typically exhibit increased male-typical behaviours and interests, as well as somewhat reduced satisfaction with the female gender role, when exposed to high levels of prenatal androgen during the prenatal period. Although the majority of girls with CAH maintain female identities, a minority of them develop gender identities that differ from those previously assigned at birth. According to research, the prenatal hormonal environment may masculinize the brain, making not just differences in childhood play and preference, but also psychological processes that contribute to gender identity.

Puberty onset and experience frequently crystallize feelings of gender congruence or dysphoria, leading to either internal reflection about those feelings or attempts to change or resolve them outwardly. Puberty is a significant window through which adolescents notice their body and gendered social expectations. Puberty is a time of explosion in sex hormones (testosterone and oestrogen) that promote development of secondary sexual characteristics and increase self-reflection about gender congruence. Many times, puberty either consolidates existing gender identity — or, for some, heightens feelings of gender dysphoria (the mismatch of experienced vs. assigned gender) leading to either social transition or medical intervention.

The delicate balance of genetic, hormonal and psychosocial factors dictates the development pathways for individuals with respect to gender identity development pathways in adolescence. Biological causes don't work in a vacuum. Postnatal socialization mediates the influence of the prenatal hormones on gender identity. There can also be remarkable plasticity—meaning the physical input we receive at birth can be changed by later experiences. For example, someone with just the same genetics or hormone levels may come to embody two very different gender identities simply from interacting and around them and in the world around which they live and who they are.

Integration of Social and Biological Influences

Integrating social and biological influences: gender identity development in adolescence is best portrayed as an interactive and changing dynamic, rather than as something that develops only as a result from one factor. Both streams influence the way gender identity is defined over time, the same dynamic occurring across multiple paths.

Dynamic interaction among biology and society: Adolescents absorb biological traits — including genes, hormone concentration and brain growth — that predispose them to particular tendencies or experiences that might be gendered. But these biological underpinnings are continually refracted and reinterpreted via the adolescent's social milieu. For example, a young person can have feelings toward gender that are intensified or intensified by pubertal changes (such as hormone levels, and body shape). The social response of the others -- whether this is positive or negative-- will have a bearing on their own self-conception or their confidence in presenting an accurate image of who they really are.

Pathways and individual differences: The study has found that the development of gender identity is highly particular; different paths are taken by a range of individuals which are determined by the

on-going interplay between biology and society. For some people, biological predispositions may have greater influence; for other people social context -- say community values or school culture, or even peer support-- becomes the chief shaping factor. Such continual negotiation enables the young people to make sense of their experience and assimilate it in a gradual manner leading, sometimes to a consistent gender identity and sometimes for other youngsters even other directions, including further exploration or transitioning.

Consolidation and Identity Successful integration of biological traits and social experience leads to the consolidation of identity over time and a feeling of stability and truthfulness about one's status to gender identity. This development can have obstacles to overcome or be supported by life events, and sustained support from social and health care systems is essential to the development of healthy adolescents.

This study reveals that adolescent gender identity formation emerges from a complex interplay of biological and social processes with distinct and personalized trajectories for adolescents. Biological variables, including genetics, prenatal hormones and pubertal change give adolescents a base structure upon which they interpret on and negotiate their gender identity development. At the same time, and in parallel, social environments like family, peers, schools and media provide external contexts with frameworks – feedback, feedback and expectations that either reinforce (affirm, challenge, reformulate) these inner experiences. Existing theoretical predictions and evidence show that neither biology nor social environment can alone explain completely the intricacies of gender identity development. Teens regularly reflect and explore what they experience as it relates to their identity, as well as the environment that encircles them, but as the name of the game, they create identity, and often do so in a reflective manner, merging what they feel as an individual with what they get in society. Social circumstances and attitudes are vital for mental health (including in the negative mental health space) and well-being (or otherwise) among gender-diverse youth. Increased awareness and inclusion amongst healthcare, educational, and community systems would be a salve for all adolescents experiencing growth with regard to gender identity.

Conclusion

Gender identity development in adolescents is a multifaceted process shaped by the continuous interaction of social environments and biological influences, highlighting the complexity and individuality of each young person's experience. As adolescents navigate puberty, cognitive growth, and evolving emotional capacities, they engage in active self-reflection that allows them to interpret bodily changes and gendered expectations in ways that feel personally meaningful. Social contexts—including supportive families, inclusive schools, empathetic peer groups, and diverse media representations—play a decisive role in either affirming or challenging an adolescent's exploration of gender identity. At the same time, biological components such as hormonal processes, neurodevelopmental patterns, and genetic factors contribute to shaping an individual's internal sense of gender, illustrating that identity formation is neither purely socially constructed nor solely biologically predetermined. Instead, gender identity emerges from a dynamic interplay between nature and nurture, where environmental signals and innate predispositions continually influence each other. Recognising this interconnectedness is essential for creating safe and affirming spaces that respect adolescents' need for autonomy, expression, and psychological

security. Moreover, understanding these influences equips parents, educators, and healthcare providers with the insight needed to support adolescents experiencing uncertainty, dysphoria, or societal pressures related to gender. Promoting holistic, compassionate, and research-informed approaches ensures that young people can navigate their gender identity journeys with dignity, confidence, and emotional well-being.

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