An artist is born not made - Is this a justifiable statement?

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ABSTRACT:

The study delves into the woven intricacy of genetic, environmental and epigenetics factors at play in being an artist. These factors shape artistic creativity while challenging the notion that creativity is solely innate or externally influenced. The genetic studies, associations between specific candidate genes and aspects of creativity such as personality traits, ideational fluency etc., highlighted the role of genetic underpinnings. Environmental factors and its impact through social interactions, cultural influences, and intrinsic and extrinsic motivation informed and impacted artistic and creative development as reviewed. Further, the role of epigenetic factors in gene expression and talent development was explored, underscoring the interaction between genetic predisposition and environmental inputs. By unravelling these complex weaves of the fabric of an artist, this essay emphasizes the multi-dimensional aspects involved in the becoming of an artist.

INTRODUCTION:

An artist's creative prowess is not solely a product of inherent genes or external influences, but it is rather a combination of a complex repartee of multiple factors. Understanding this intricate web of mechanisms which underlie creative abilities involves exploring the dynamic relationships between genetic predispositions [1], environmental exposures [2] cognitive processes and multicultural exposures [3]. Artists, art making and creativity have captivated human interest since the dawn of our species [4]. Individuals who have a unique ability to create visual imagery have garnered special reverence. From the earliest cave paintings to contemporary masterpieces, the act of creation stands as a testament to our capacity to innovate and express artistically. Gustav Fechner [5] is often considered a founding figure in psychology, he emphasised the method of production in his general laws which guide human thoughts and actions. This early interest in art-making laid the foundation for subsequent research into visual creativity.

However, despite the enduring fascination with creative expression, empirical studies on visual art making and creativity have been relatively scarce (6). This scarcity can be attributed to various factors including the ineffable nature of art production and the complexity of studying the creative process empirically [7]). Nevertheless, questions about the origins of artistic talent, neural mechanisms underlying creativity [8], creative development ([9] and the changing nature of the brain have fueled ongoing research endeavours [10]. The complex question of nature vs nurture is further mystified by the open-ended nature of both the artist and the workings of an artist. What factors inform the

becoming of an ‘artist’? This paper explores this layered mystery through the untangling of the broad underpinning of genetic, environmental and epigenetic factors contributing to the making of an artist, through some studies done so far.

An artist by birth- exploring the notion of the Born Genius

There are many factors influencing the artist or creative, this section looks at genetic and personality factors that contribute to the study of identifying factors in an artist. Focusing on the genetic factors and emphasizing the contribution of genetic factors is a study [11] where the researchers aimed to understand the origin of individual differences in aptitudes and talent across various domains within the normal ability range among Monozygotic (identical) twin and dizygotic(non-identical) twins. It aimed to investigate the nature of variation in aptitude and exceptional talents in population-based twin samples. They analysed the self-reported data from 1685 twin pairs of ages between 12 and 24 across domains such as music, arts, writing, language, chess, mathematics, sports, memory and knowledge. They assessed the associations between variables and genetic analyses to estimate the heritability of aptitude and talent. The study did find genetic factors influencing both aptitude and talent, with heritability estimates ranging from moderate to high, indicating that genetic factors accounted for a substantial portion of the observed variation in abilities. Further studies [12] have shown a clear association between ideational fluency and specific candidate genes, including DAT, COMT, DRD4 AND TPH1 among college students who were the participants, indicating a genetic basis for these aspects of creativity. However, the relationship between these genes and originality, which is defined as a critical component in the standard definition of creativity [13] remains uncertain. Resonating with the genetic studies, another study conducted [14] explored the structure and sources of individual differences in creativity. This study utilised a multi-trait-multimethod twin study approach. The methodology of this study involved employing various data sources including self and peer reports, observer ratings, and test scores from two German twin studies. The researchers aimed to discern two aspects in the realm of creativity, that is, perceived creativity which reflected typical creative thinking and behaviour, additionally, they considered creative test performance which represented the maximum task-related creative performance. This study found that perceived creativity was associated with specific personality traits, particularly in openness to experience and extraversion traits. On the other hand, creative test performance showed specific links to cognitive abilities, particularly intelligence, in addition to openness to experience. Furthermore, in their exploration of the genetic component of creativity and its relationship to intelligence and personality traits, they discovered that heritability of creative test performance could be accounted for genetic

components of intelligence, and openness, while a significant genetic component in perceived creativity remained unexplained. Importantly, environmental influences emerged as a primary source of individual differences, even with controlling for random error and method variance. These studies show the influence of genetics in certain aspects of creative aptitudes while indicating the other aspects which possibly influence creativity as well.

Environmental factors influencing an artist

While we observed that, the genetic studies also hinted at environmental factors in addition to genetic influences, this section looks at those environmental factors in a nutshell. As a multifaceted phenomenon, creativity is influenced by a myriad of environmental factors which will be explored as external environmental factors forming societal and contextual influence and internal factors which form the intrinsic and behavioural environment created within an individual. External environmental factors have been observed to exert a profound influence on artist development. Social interactions, cultural influences, and organizational contexts play pivotal roles in fostering creativity [15][16]. Collaborative environments, constructive feedback, and supportive organizational cultures have been shown to enhance creative performance [17]. Furthering these factors, the presence of diverse perspectives and exposure to different cultural contexts can stimulate creativity by broadening an individual's horizon and encouraging innovative thinking [18].

These factors have been echoed in the impact of the parental environment [19] which mentions that approximately 30% of Nobel Prize laureates experienced the loss of at least one parent, while writers of both fiction and non-fiction often emerge from unhappy home environments. In addition, creative writers were found to be most likely later-born. Additionally, diverse experiences were noted to weaken the constraints imposed by conventional society. These challenging experiences have been observed to strengthen an individual's capacity to persevere in the face of obstacles [20].Highlighting the presence of a guide on the creative journey, the availability of a role model or mentor has also been identified as a significant indicator of creative development.

Not only do challenging events impact the internal state and the capacity to persevere, but Internal factors do play a large and crucial role in shaping creative outcomes as well. Amabile[21] emphasizes the significance of intrinsic motivation, suggesting that individuals are most creative when they are internally driven/motivated by the enjoyment and satisfaction derived from the creative process by itself. In her componential model of creative arts [22], she highlighted three dominant factors which included domain-relevant skills, creativity-relevant processes and task

motivations and the social environment. High levels of intrinsic motivation were observed in a study of uncovering child prodigies [23]. Studies [24] further elaborate on this concept while highlighting intrinsic motivation as a key determinant of creative behaviour. In addition to these, cognitive styles, personality traits such as openness to experience, and skill development are identified as internal components of creativity [25].

Epigenetic factors and their effects on an artist

The role of genetic and environmental factors has been considered individually in the previous section, however, there is a third influence which is the interplay between genetic and environmental factors. Simonton [26] explored this intersection in the development of talent, in particular, with artistic creation. Epigenetic factors refer to the changes in gene expression that occur with alterations in the underlying DNA sequence, influenced by environmental stimuli. Research in epigenetics has shown that experience and environmental influences can impact gene expression, contributing to the development of artistic talent. Epigenetic factors and their role in shaping creative potential have been underscored by a study [27] of the dopaminergic imbalance in Parkinson's patients which suggested changes in artistic styles. Furthermore, research by Cantor et al., [28] emphasized the prominence of epigenetic factors in individual development. Additionally, a study by Vartanian and others [29] suggested that genetic and epigenetic factors influence brain characteristics, which in turn impact personality traits associated with creativity.

While Simonton's emergenic model argues for deliberate practice, he also states that the importance of genes in talent development changes over time. The deliberate practice theory suggests that as individuals engage in more deliberate practice, the influence of genes on talent diminishes. However, gene-environment interaction suggests a more nuanced perspective which indicates that genetic predispositions may become more critical with practice. Individuals with more genetic traits may benefit more from deliberate practice, leading to a greater development of talent [30]. This is echoed by further studies [31] which indicated that the heritability of artistic achievement increases in environments enriched with artistic stimuli, such as exposure to music and arts during childhood.

The bio-psycho-behavioral model [32] underscores the multifaceted nature of creativity summarizing the discussion on the multidimensional nature of creativity suggesting that it emerges from the interplay of biological predispositions, cognitive processes and environmental influences. It encompasses a wide range of associations and concepts related to creativity, spanning from

characteristics of personality and intellectual ability to traits associated with mental disorders and spontaneous thought. While shedding light on a comprehensive understanding, it builds upon prior work on predicting real-life creative behaviour and extends the framework to three levels of analysis: Neurobiological system which includes a dopaminergic system [33], Default Mode network [34] and executive control network [35], at the bottom of the hierarchical chart. The next level includes psychological constructs of individual differences associated with creativity such as personality [36] and ability to produce novel ideas [37] dimensions, the top of the chart includes real–life behaviour[38]. The hierarchical model suggests a linear interaction of the variables at the higher level as influenced by factors at the lower level, illustrating the complex and interconnected role of creativity.

CONCLUSION:

In conclusion, the synthesis of existing studies has revealed a robust interaction among various factors influencing artistic creativity. This paper has explored the multiple aspects contributing to an artist's creativity, acknowledging genetic predispositions while also recognizing the broader array of influences at play. By doing so, it aimed to challenge the notion that artistic talent is solely determined by one's birth conditions.

These studies not only unravel parts of the puzzle of understanding the functioning of an artist but also contribute to neurological studies in the broader context. The importance of studying these factors is underscored by the chapter (Pelowski and Chamberlain (2023)) which discusses the complex interplay between art making, brain function and contextual factors while also highlighting the need for alternative approaches such as exploring intersections with neurodegenerative diseases (35). This overview emphasized on the importance of studying the changes in perceptual, attentional and motivational capacities to understand how neurological changes may impact art-making, offering insights into artistic phenomenology and brain function.

Additionally, Recent updates to the standard definition of creativity by Mark A. Runco (2023) shed light on essential themes defining creativity, including originality, effectiveness, value and surprise. However, the emergence of machine creativity prompted the reconsideration of these criteria. To differentiate human creativity from artificial creativity, Runco introduced authenticity and intentionality as defining characteristics. As authenticity and intentionality are quintessentially human qualities, further research should delve into their significance in the context of artistic creativity.

Future studies can explore the interplay between authenticity, intentionality and the influences of its nature and nurture on the development of artistic talent and the creative process. Investigating how these artist's identities, motivations and approaches to creative expression can provide valuable insights into the complexities of artistic creativity. By elucidating the distinct qualities of human creativity in comparison to machine-generated output, studies can deepen our understanding of the essence of artistic expression and the becoming of an artist.

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*Special interest

** Outstanding interest

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