

The Ecopsychological Relevance of Nathaniel Hawthorne's *Rappaccini's Daughter* for an AI-Driven World

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ABSTRACT

The ethical and environmental implications of technological advancement are frequently questioned in the age of artificial intelligence (AI) and biotechnology. We examine *Rappaccini's Daughter* by American Dark Romantic Nathaniel Hawthorne to show how the short story resonates with contemporary concerns about AI and automation that may replace human connection and empathy. We employ a contextual and environmentally sensitive interpretation of the text to reveal Hawthorne's criticisms of an over-reliance on human reason and science, which perpetuates the characters' alienation and dehumanization. In light of concepts in ecopsychology, i.e., biophobia and alienation, the findings reveal that *Rappaccini's Daughter* 1) warns against the tragic consequences of manipulating nature beyond control, and 2) explores the awkward relationship between artificial creation and environmental ethics. We conclude that unscrupulous scientific pursuits ultimately lead to ecological and psychological harm and the loss of genuine beauty. Seen as cautionary tales, 19th-century literary works such as *Rappaccini's Daughter* can thus be revisited as they offer insights into how individuals today cope with ecological anxieties.

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INTRODUCTION

Artificial intelligence (AI) has changed people's lives in many ways, but its long-term consequences are still debatable and difficult to predict. In the education sphere, for instance, the use of AI and ethical considerations are among the unresolved issues (e.g., Borenstein & Howard, 2021; Selwyn, 2022). Indeed, the collection, use, and misuse of data for AI training and feeding may present ethical concerns and unforeseen risks to individuals. Exploring the growing impact of AI on human life, Borenstein and Howard (2021) advocate for AI ethics in education by integrating it into the curriculum, addressing ethical challenges, and cultivating moral sensitivity among creators and stakeholders in designing AI algorithms. It is interesting to note that current research on AI in language and literature teaching largely shows an optimistic outlook. Advanced technology enhances students' participation in literature-related activities, creative and critical thinking, and autonomous learning (Chen & Yuan, 2022; Darwin et al., 2024; Pokrivcak, 2024).

Meanwhile, in addition to the danger of AI-driven automation that threatens human creativity and agency, technological advancements worsen climate anxieties. Genetic engineering and synthetic biology have raised

ethical and environmental concerns. The rapid development of AI and biotechnology has sparked ethical and environmental challenges (Al-Delaimy, 2022; Ashfi, 2024; Sidiropoulos & Anagnostopoulos, 2024; Stahl, 2021).

Given the crucial shifts in human-nature interactions, the urgency of climate change, and rapid technological innovations, literature studies, particularly of nineteenth-century classics, should integrate ecological ethical themes to maintain their contemporary relevance. Our central inquiry is whether reading classic fiction can continue to offer valuable insights into human experience and nurture critical thinking as AI assumes more cognitive functions.

Ecopsychology may clarify the need for a more ethical relationship between technology and the natural world, especially in an era marked by diverse scientific breakthroughs and debate over AI's challenges and opportunities. Specifically, we will examine the psychological and environmental elements in Nathaniel Hawthorne's *Rappaccini's Daughter*, which first appeared in 1844 during the so-called Dark Romantic era, using ecopsychology as a framework. Nature's mysterious and untamed qualities contribute to the characters' environmental alienation in Dark Romantic works. Existing research on classic literature has limited alignment with ecopsychology, and this study aims to address these gaps. The discussion sheds light on the psychological states of characters in literary works that are relevant to today's human-nature relationships. An ecopsychological reading of the text, which underscores how humans relate to nature, can provide tools for understanding and addressing urgent ecological degradation, such as deforestation, natural resource depletion, and pollution.

REVIEW OF LITERATURE

Dark Romanticism and *Rappaccini's Daughter*

Dinçer's seminal finding in 2010, as discussed in (Auñón, 2021), claims that Dark Romanticism evolved from a resistance to the Age of Enlightenment to the Industrial Revolution. Dark Romanticism is a subset of Romanticism in the late eighteenth and early nineteenth centuries that focuses on the more negative aspects of the tight interaction existing between human psychology and the natural world. Dark Romanticism places a specific focus on raw emotion, pure aesthetic experiences, and other forms of intense sensation (Auñón, 2021). Romantic authors frequently depict nature in a positive and uplifting manner, and view it as a source of inspiration, beauty, and renewal. However, their dark counterparts take a different approach by depicting nature in a mysterious and foreboding manner, such as through the use of mist, lightning, and buildings that frequently feature haunts and destruction (Buller, 2019; Dewi, 2021).

As a literary movement, Dark Romanticism often portrays nature as mysterious, foreboding, and reflective of the darker aspects of human minds (Dewi, 2021; Peng & Li, 2024). Another feature of Dark Romanticism is its resemblance to Gothic fiction, which is distinguished by the inclusion of certain clichés seen in dark romantic works, such as supernatural beings with frequent elements of darkness and pure horror (Auñón, 2021; Dewi, 2021). Such characters are prone to alienation that can manifest as fear of natural elements, obsessions, self-need, or the inability to recognize that the world is shaped by human action. Dark Romanticism explores irrationality, demonic aspects of human nature, and gloomy topics such as suicide, death, madness, and terror. This category includes motifs from the extraordinary world, such as escapism and love turning into lust.

Copious studies have been on Dark Romantic American literature (e.g., Dewi, 2021; Harsono & Dukut, 2020; Khan et al., 2023) to date. Nathaniel Hawthorne's works often highlight the complexities of human nature and

human experience (Buller, 2019; Theresia & Dewi, 2021). Hawthorne frequently depicts nature as enigmatic, untamed, hostile, and melancholic, evoking the unknown, as seen in *Young Goodman Brown*, *The Minister's Black Veil*, and *Dr. Heidegger's Experiment*, to name just three.

In particular, *Rappaccini's Daughter* has continued to attract scholarly attention, as indicated by various studies published in the last two years on topics ranging from distorted self-love (Anwar & Bai, 2024), mad scientists' masculinities (Demirtaş & Korpez, 2023) to media adaptation (Petitti, 2023). Although published in 2004, *The Half-Vanished Structure: Hawthorne's Allegorical Dialectics* is an influential work by Magnus Ullén, which contends that Hawthorne's writings are shaped by the dynamic interplay between literal and figurative meanings, with *Rappaccini's Daughter* receiving considerable analysis. Ullén further explores his view about Hawthorne's critiques of scientific overreach and the natural order through allegories by exploring Hawthorne's *Septimus Felton; or, The elixir of life* (2021). Both *Rappaccini's Daughter* and *Septimus Felton* depict characters who are obsessed with eternal beauty or life by manipulating nature and ignoring ethical considerations.

Although insightful, the studies above focus on people with little attention paid to the ecosystem, except for Mnassar's (2022) work, which explores *Rappaccini's Daughter* through ecophilosophy. Mnassar (2022) believes that people are weak and incapable of divine perfection; therefore, they should preserve the nature's systems and regard them as living things with souls and spirits.

Ecopsychology: A Framework

Ecopsychology is an interdisciplinary pursuit aiming to understand the psychological and emotional aspects of human interactions with the natural world. It has been associated with various disciplines, including environmental psychology, transpersonal psychology, and spirituality, and has the potential to help heal the mind and restore the Earth. Ecopsychology emphasizes the interconnectedness between human well-being and the natural world, highlighting the importance of nature in civilization and culture (Fisher, 2012). Among the significant figures in the field is Theodore Roszak, whose book *The Voice of the Earth*, published in 1992, began to popularize the term (Danon, 2019). Roszak believes that traditional psychology must revisit its theory and practice in an ecological framework to positively influence the environmental crisis. Ecopsychologists rely on ecology theory, which describes the deep intertwining of humans and the non-human environment.

In probing the connection between humans and the natural world, ecopsychology may focus on the biophilia hypothesis introduced by psychologist Eric Fromm in 1964. This hypothesis suggests that humans have an innate propensity to connect with nature due to their interdependence with the genomic structure. In 1984 Robert Kellert introduced the biophilia hypothesis, highlighting biophilia expressions. Kellert's *A Typology of Biophilia Values* identifies nine values based on the biophilia hypothesis, including utilitarian, naturalistic, ecologicistic-scientific, aesthetic, symbolic, humanistic, moralistic, dominionistic, and negativistic (2017).

We further observe the related concept of alienation, which has been a topic of discussion among philosophers, writers, artists, and social scientists, including ecopsychologists, for years, as it has permeated significant social problems in modern society. Originating from Karl Marx's economics, alienation refers to the alienation of workers, which includes slavery, objectification of labour, and isolation (Soper, 2016). Under capitalism, people are estranged from both internal and external nature in four ways: from one another, their species, the outcome of their labour, and from their labour itself. Scholars have different interpretations of alienation, distinguishing between the loss or absence of something essential to human well-being and separation from oneself. They apply alienation concepts to environmental ethics, arguing that recognizing the relationship between natural environments and human activities is necessary to overcome alienation.

Indeed, environmental alienation and disruption of the traditional balance between people and their environment are themes frequently explored in literary studies. Indriyanto (2022), for example, investigates the impact of leprosy on Native Hawaiians under Western colonization through three Hawai'ian-American novels, focusing on forced segregation, stigmatization, and Western ideals that harmed their relationship with their home. Similarly, a separation between humans and the natural world that becomes a core concept in environmental alienation is also true in selected Indonesian and Malaysian novels that depict deforestation and environmental destruction (Wiyatmi et al., 2022). Meanwhile, Suryani and Dewi (2024) employ postcolonial ecocriticism to explain how Western modernity alienated the Igbo, Mentawai, and Aitubu communities in African and Indonesian novels, severing spiritual and cultural ties, destroying their lands for economic gain, and undermining their traditional livelihoods and land rights. The three key studies aforementioned employ contemporary novels from different continents to demonstrate how colonial forces accelerate environmental alienation, but they do not address individual alienation. It is worth noting that environmental alienation is equally personal.

METHOD

Both ecopsychology and Dark Romanticism are distinct approaches to understanding human-nature relationships. Dark Romanticism concentrates on the negative aspects of a relationship, whereas ecopsychology examines its psychological and emotional dimensions. The two approaches will be used to scrutinise Hawthorne's dark romantic short story to investigate the relationships and mental states of the characters while promoting environmental awareness and harmony between humans and nature. *Rappaccini's Daughter* was previously published in *The United States Magazine and Democratic Review* in December 1844. The text used here is taken from the book *Nathaniel Hawthorne: 70+ Short Stories in One Edition*, published by Musaicum Book (Hawthorne, 2017).

The main focus of the analysis includes characters' experiences of environmental alienation, their biophilic or biophobic inclinations, and how these relate to their psychological states. The story will be closely examined to determine how nature is depicted, how humans engage with nature, and how they react psychologically. First, we identified the presence or absence of biophilic tendencies using Kellert's (2017) nine hypothesized expressions of biophilia, such as finding solace in nature, expressing awe at the beauty of the natural world, and displaying knowledge or concern for ecological systems. We also looked at examples of environmental alienation, such as anxiety, contempt, indifference, seeing nature as a barrier, or striving to control or influence nature. Second, the analysis examined how Dark Romanticism's emphasis on the darker side of human nature and the sublime force of nature influences the characters' biophilia and environmental estrangement. Finally, the study provided interpretations of the characters' psychological states, the evolution of the human-nature relationship, and the significance of these insights for contemporary ecological issues.

RESULTS AND DISCUSSION

Scientific Ambition and Environmental Disruption

The short story *Rappaccini's Daughter* is set in Padua, Italy, and revolves around a scientist named Dr. Rappaccini who has a toxic plant in a garden with purple blooms sitting in a marble vase in the middle of a fountain. An incoming student, Giovanni, is enchanted not only by the beautiful garden but also by Beatrice, the scientist's daughter. Their romantic relationship is tainted when the purple flower poisons Giovanni. Inspired by Baglioni, Rappaccini's rival, Giovanni gives Beatrice an antidote that kills her, revealing that she was poison itself. The story ends with Beatrice's tragic death and the revelation of Rappaccini's cruel experiment.

Critics often assume that Dr. Rappaccini and most of Hawthorne's characters are mentally unstable due to their obsession. Comparing *Rappaccini's Daughter* and *The Birthmark* to Mary Shelley's *Frankenstein*, Anwar and Bai (2024) use Rousseau's concept of Amour-Propre to demonstrate that all the main characters' self-obsession and selfish demands over ethical responsibilities lead to solitude, death, and disaster. While the study contributes to a deeper understanding of the pervasive effect of self-centeredness on human behavior, it does not particularly address the characters' fixation with nature or the likelihood of being biophilic or biophobic.

To begin with, Giacomo Rappaccini is described as a well-known person in Naples and a genius, as evidenced by his illustrious career in science and luxurious garden. The garden is enchanting and mystical, which Giovanni compares it to "the Eden of the present world" at first sight (Hawthorne, 2017, p. 461). Rappaccini earns his reputation by making a whole garden to gather strange flowers and plants and "... distils these plants into medicines that are as potent as a charm" (Hawthorne, 2017, p. 460). He is keen on producing material value from his garden in the form of medicine that can be used for human survival. Ironically, the scientist's daughter tragically dies after consuming the antidote for the poisonous blossoms of his experimentation.

At the same time, Rappaccini is a nature-loving doctor. He appears to have a naturalistic style of expression, which is one that finds fulfillment in intimate contact with nature, including wonder, awe, and curiosity that come from directly witnessing the complexity and richness of the natural world. Hawthorne writes:

Nothing could exceed the intentness with which this scientific gardener examined every shrub which grew in his path: it seemed as if he was looking into their inmost nature, making observations in regard to their creative essence, and discovering why one leaf grew in this shape and another in that, and wherefore such and such flowers differed among themselves in hue and perfume. (Hawthorne, 2017, p. 461)

However, in light of ecopsychology, his experiments with poisonous plants betray this assessment. As the next statement right after the above quote reads: "Nevertheless, in spite of this deep intelligence on his part, there was no approach to intimacy between himself and these vegetable existences" (Hawthorne, 2017, p. 461).

The keyword here is "intimacy," which is non-existent between the doctor and his research. Rappaccini's hobby of using various kinds of plants to make medicine shows that he uses nature for scientific purposes. To achieve his goals, he disregards ethical implications, including utilizing his daughter as a subject for his experiments. Thus, the scientist has a somewhat love-hate relationship with nature. He loves nature and mistreats it alike.

Rappaccini's treatment of nature indicates that he is a utilitarian, if not pragmatic, person. Kellert's *A Typology of Biophilia Values* (2017) proposes nine values, the first of which is utilitarian value. The others are naturalistic value, ecological-scientific value, aesthetic value, symbolic value, humanistic value, moralistic value, dominionist value, and negativistic value. The utilitarian inclination towards the environment covers the conventional notion of the nature's material value and what humans can derive from it as a fundamental basis of human sustenance.

To exacerbate this scientific pursuit above human life, Rappaccini's laboratory is described as a "curious place" filled with antique items and features a mirror that contains "the spirits of all the doctor's deceased patients... and would stare him in the face whenever he looked thitherward" (Hawthorne, 2017, p. 461). Here, Rappaccini exhibits the second typology of biophilia values, i.e., naturalistic, defined as "satisfaction from direct experience/ contact with nature" (Kellert, 2017, p. 54).

Rappaccini's inclination toward the science of nature leads him to the third typology of biophilia values: ecologicistic-scientific, which refers to the "recognition of organizational structure and complexity barely discernible to the average person" (Kellert, 2017, p. 57). Regretfully, Rappaccini has a certain motivation that drives him to defy nature to complete his scientific mission. Therefore, he does not exhibit all four values in order: aesthetic, symbolic, humanistic, and moralistic. Instead, Rappaccini goes too far, skipping four levels in favor of the eighth value: dominionistic. The function of dominionistic type, which is defined as "mastery, physical control, dominance of nature," comprises "mastery, physical control, dominance of nature" (in Kellert, 2017, p. 71), as demonstrated by the Paduan plant specialist. Rappaccini's goal to perfect nature by producing superhuman beings demonstrates a dominant attitude, similar to playing God.

Rappaccini is a notable person, not only for his well-known avocation for plants, but also for his capability as a doctor. This brings the discussion to the second character, his colleague, Professor Pietro Baglioni, who praises and loathes him alike, saying

The truth is, our worshipful Dr. Rappaccini has as much science as any member of the faculty—with perhaps one single exception—in Padua, or all Italy; but there are certain grave objections to his professional character ... He would sacrifice human life, his own among the rest, or whatever else was dearest to him, for the sake of adding so much as a grain of mustard seed to the great heap of his accumulated knowledge (Hawthorne, 2017, p. 464).

Baglioni is jealous of Dr. Rappaccini. The above quote essentially means that it would be inappropriate for a medicine teacher not to acknowledge and praise a highly skilled physician like Dr. Rappaccini. Emphasizing Rappaccini's exceptional medical skills and knowledge, Baglioni suggests that he is on par with or even surpasses other esteemed medical faculty members.

Like his rival, Baglioni is also utilitarian because he undermines Rappaccini's efforts by using Giovanni, the young science student and son of his best friend, as a tool. His ambition to beat his opponent, even at the expense of injury, motivates his actions. Based on the principles of ecopsychology, Baglioni's persona is more consistent with violence and a disconnection from the natural world than with humanism. It is widely documented that he is often likened to Satan in the biblical and allegorical sense (e.g., Cáffaro, 2022; Mulyani, 2020; Salmaso, 2024). At first, he appears sympathetic to Giovanni and concerned about being Rappaccini's experimental object, hence his warning to the younger man. Later, it is clear that his ulterior motivation is to compete with Rappaccini. The following is the professor's musing after meeting Giovanni and poisoning the young mind with the sole purpose of jeopardizing Rappaccini's project.

"The youth is the son of my old friend, and shall not come to any harm from which the arcana of medical science can preserve him. Besides, it is too insufferable an impertinence in Rappaccini, thus to snatch the lad out of my own hands, as I may say, and make use of him for his infernal experiments. This daughter of his! It shall be looked to. Perchance, most learned Rappaccini, I may foil you where you little dream of it!" (Hawthorne, 2017, p. 470).

Baglioni belongs to the fifth typology of biophilia values: symbolic. Baglioni metaphorically treats nature to communicate his thoughts, albeit negatively. Symbols permeate the narrative of his appearance in the story. Baglioni recounts to Giovanni how Alexander the Great fell in love with a woman who was a gift from an Indian ruler and who, like Beatrice, had been born poisoned. A recent study by Salmaso (2024) is helpful here. Salmaso highlights Hawthorne's vast knowledge of the history and cultures of Padua in setting his short story, such as Padua's Botanical Gardens, academic rivalry in the University of Padua, and philosophical contestation in Renaissance times. Specifically, Hawthorne's reference to Benvenuto Cellini as the creator of Baglioni's

silver vial and the Borgia family connection with it underlines the character's evil plot in convincing the reluctant Giovanni to give Beatrice the antidote that kills instead of healing her. To quote the author at length:

"It is a dream," muttered Giovanni to himself; "surely it is a dream."

"But," resumed the professor, "be of good cheer, son of my friend. It is not yet too late for the rescue. Possibly we may even succeed in bringing back this miserable child within the limits of ordinary nature, from which her father's madness has estranged her. Behold this little silver vase! It was wrought by the hands of the renowned Benvenuto Cellini, and is well worthy to be a love gift to the fairest dame in Italy. But its contents are invaluable. One little sip of this antidote would have rendered the most virulent poisons of the Borgias innocuous. Doubt not that it will be as efficacious against those of Rappaccini. Bestow the vase, and the precious liquid within it, on your Beatrice, and hopefully await the result."

Baglioni laid a small, exquisitely wrought silver vial on the table and withdrew, leaving what he had said to produce its effect upon the young man's mind (Hawthorne, 2017, p. 479).

Baglioni's actions, coupled with the rivalry with Rappaccini, are consistent with the idea of scientific superiority, which holds that the quest for knowledge and mastery over nature can have unwanted results. In ecopsychology, this excessive pride in science may cause ecological violence since it shows a detachment from nature and a sense of human self-importance (Anwar & Bai, 2024). It suffices to note here that Baglioni's lethal antidote exemplifies his dominionistic type, in addition to the first, utilitarian, and the ninth or the last, negativistic biophilia values. To illustrate, Baglioni appears to have naturalistic and moralistic values when he attempts to save the relationship between Giovanni and Beatrice by creating poison, until we discover that rivalry is his primary reason, to say nothing of the natural chaos it creates. Mnassar is correct in his argument that this short story unveils Hawthorne's ecocritical viewpoint, highlighting that nature is divinely ordained and that humans should respect and protect natural systems (2022). However, unlike Mnassar (2022), who portrays Rappaccini solely as a mad eco-villain, our ecopsychological reading exposes the more nuanced portrayal of the professor.

With the rise of AI today, we can compare the scientific ambition of Rappaccini and Baglioni and their rivalry to competition in the industrial world. The toxic garden that causes harm to people, Beatrice's genetic manipulation by her father, and Baglioni's invented antidote are all examples of uncontrolled technological advancement that crosses ethical boundaries. Borenstein and Howard (2021) are correct in saying that AI's revolutionary impact needs ethics education, with companies ideally employing a chief AI ethics officer to promote socially responsible AI technology and job creation.

We now focus on the depiction of Giovanni Guasconti. As a newcomer in town, Giovanni notices how Rappaccini tenderly looks at his plants. This has an impact on Giovanni, who admires the beauty of nature to the point where he considers how fortunate he is to be able to gaze at the "lovely and luxuriant vegetation" and sees Rappaccini and his daughter as "a symbolic language to keep him in communion with Nature." (Hawthorne, 2017, p. 460). Natural inclination for nature makes people eager to explore and discover nature, leading to increasing curiosity, outdoor skills, and mental/physical development. Based on Kellert's Biophilia Typology, Giovanni embodies the fourth and fifth values: aesthetic and symbolic. For him, nature is a source of inspiration, harmony, peace, and security, as symbolized by the garden's lush beauty and Beatrice's mesmerizing appearance, which makes his pulse "throb with feverish blood" (Hawthorne, 2017, p. 488). However, when the story develops, the young man is also of the utilitarian type, like his two mentors. However,

unlike the older men, Giovanni uses Beatrice to satisfy his romantic desire and his interests in maintaining his emotional attachment to the beautiful young woman. Baglioni, in turn, uses him to enact Baglioni's revenge on Rappaccini. This finding resonates with Mulyani's reading of Hawthorne's *The Birthmark, Rappaccini's Daughter*, and *Ethan Brand*, arguing that Hawthorne often demonstrates scepticism towards science and mesmerism by depicting tragic scientists with no human sympathy (Mulyani, 2020). In *Rappaccini's Daughter*, the enchanted garden and Beatrice's love mesmerize Giovanni, leading him to understand the young woman's love and her father's obsessive experiment. Although Giovanni's biophilia eventually became increasingly biophobic, it is obvious that attachment and detachment from nature are important aspects of psychological development.

At this stage, ecopsychology viewpoints reveal Beatrice as the representative of nature itself, whom Giovanni in his bewilderment describes as "hues of purple or crimson and of perfumes heavily delectable" with a voice "as rich as a tropical sunset" (Hawthorne, 2017, p. 463). However, because she is also a tool used by her father, and later by Giovanni for love and Baglioni for revenge, Beatrice is not the so-called Nature in conventional terms. Here, the alienation is clear. All characters are estranged from nature in one way or another. Each character is cut off from nature. Giovanni is perplexed by Beatrice's condition as an experimental subject. The scientists are separated from their species: Rappaccini with the fake flower and Baglioni with the thwarted poison meant to cure Beatrice. It is to this quality of nature that the discussion now turns.

Nature versus Artifice

We will now examine *Rappaccini's Daughter* through the oscillation between nature and artifice by aligning it with Kellert's biophilia tendencies. Kellert (2017, p. 77) describes the levels of the nine values and their effects on human psychological development, saying "Each expression of the biophilic tendencies —the aesthetic, dominionistic, ecologicistic-scientific, humanistic, moralistic, naturalistic, symbolic, utilitarian, and even negativistic— has been depicted as potentially enhancing the basis for a profound development of self." According to Kellert (2017), an ethic of care, conservation, and respect for nature can grow when people believe that their relationships with nature are gradually improving. As a result, being completely biophilic or biophobic is impossible, as demonstrated by the story's characters in varying degrees of intensity.

Rappaccini appears to love his plants, viewing them as a symbol of his connection with nature. However, through Giovanni's observation, the plant doctor is biophobic, distanced, and suspicious of the artificial garden he created by himself. Hawthorne writes:

[H]e avoided their actual touch or the direct inhaling of their odours with a caution that impressed Giovanni most disagreeably; for the man's demeanours was that of one walking among malignant influences, such as savage beasts, or deadly snakes, or evil spirits, which, should he allow them one moment of license, would wreak upon him some terrible fatality (2017, p. 461).

Giovanni further observes that Rappaccini, the "distrustful gardener," wears a pair of thick gloves and a mask over his mouth and nostrils, fearing that the magnificent purple flower grown under his very own control and monitor hides "a deadlier malice" that may backfire on him (Hawthorne, 2017, p. 462). The young man continues to doubt Rappaccini, saying "Was this garden, then, the Eden of the present world? And this man, with such a perception of harm in what his own hands caused to grow, —was he the Adam?" (Hawthorne, 2017, p. 461).

Here, we see that Rappaccini is of the dominionistic, ecologicistic-scientific, and even negativistic type. The artifice garden barely shows his aesthetic, humanistic, and, let alone, moralistic side.

Moving to Giovanni, his knowledge of Rappaccini from observing his garden experiments, combined with Baglioni's criticism of his rival, causes the young man's admiration of the plant doctor to turn into morbidity:

The aspect of one and all of them dissatisfied [Giovanni]; their gorgeousness seemed fierce, passionate, and even **unnatural**...Several also would have shocked a delicate instinct by an appearance of **artificialness** indicating that there had been such commixture, and, as it were, adultery, of various vegetable species, that the production was **no longer of God's making**, but the monstrous offspring of man's depraved fancy, glowing with only an **evil** mockery of beauty (Hawthorne, 2017, p. 472) [Emphases added]

Giovanni's belated impression on Beatrice is that "flower and maiden were different, and yet the same, and fraught with some strange peril in either shape," despite his intense attraction to her (Hawthorne, 2017, p. 463). The young man becomes alienated from nature after being poisoned. His rejection of Beatrice's hybrid nature, i.e., human and artifice, shows that he is unable to accept her as she is, opting for a crude classification, either "natural" or "artificial." "These sentiments of fear and alienation from nature can foster unreasonable human tendencies and the infliction of excessive harm and even cruel behaviour on animals and other elements of nature" (Kellert, 2017, p. 69).

Giovanni comes across as biophobic upon knowing that the girl and the manipulated blossom are but Rappaccini's scientific manipulation. The engineered beauty of Beatrice and the formerly thought Edenic garden scares Giovanni, turning him from an aesthetic, and humanistic type into a person with negativistic biophilia. Quoted at length below is Giovanni's cruel indictment of Beatrice.

Giovanni's rage broke forth from his sullen gloom like a lightning flash out of a dark cloud.

"Accursed one!" cried he, with venomous scorn and anger. "And, finding thy solitude wearisome, thou hast severed me likewise from all the warmth of life and enticed me into thy region of unspeakable horror!"

"Giovanni!" exclaimed Beatrice, turning her large bright eyes upon his face. The force of his words had not found its way into her mind; she was merely thunderstruck.

"Yes, poisonous thing!" repeated Giovanni, beside himself with passion. "Thou hast done it! Thou hast blasted me! Thou hast filled my veins with poison! Thou hast made me as hateful, as ugly, as loathsome and deadly a creature as thyself—a world's wonder of hideous monstrosity! Now, if our breath be happily as fatal to ourselves as to all others, let us join our lips in one kiss of unutterable hatred, and so die!" (Hawthorne, 2017, p. 482).

Marxist alienation, which includes objectifying labor and isolating workers from nature, their species, the outcome of their effort, and themselves (Soper, 2016), can be used in conjunction with ecopsychology. Beatrice's artifice alienates Giovanni and vice versa. However, alienation is most clearly seen in the plant professor. Rappaccini's dominionistic, ecologicistic-scientific, and negative values alienate the garden, Beatrice, and others. Ecopsychology is complementary to the aberrant, alienated, and frenzied characters in Dark Romantic narratives (Dewi, 2021; Gabani, 2017; Theresia & Dewi, 2021).

To some extent, Baglioni shares common biophobic expressions with Rappaccini because both scientists believe in human manipulation of nature. Baglioni's disapproval of Rappaccini stems from his envy. By

persuading Giovanni to give an antidote that eventually kills Beatrice, Baglioni casts doubts on the nature's wisdom. His alienation and fear of natural order lead him to inhumanity. Hawthorne poignantly illustrates this: Professor Pietro Baglioni, looking forth from the widow triumphantly yet horrified, called out loud to the plant doctor "Rappaccini! Rappaccini! and is *this* the upshot of your experiment!" (Hawthorne, 2017, p. 485).

The author has left us contemplating by italicizing the word "this" to stress the dangers of impulsive scientific research, echoing the fake reality in today's AI era. Here, "the upshot of [Rapaccini's] experiment" is analogous to algorithm performances and data mining that harm humans. Speaking about the implications of developing technologies, including AI, Ashfi (2024, p. 4) points out, "The choices made in the development and application of these technologies are deeply intertwined with our ethical principles."

When evaluated from an ecopsychological perspectives, Beatrice is the least biophobic, leaning toward biophilic, and ethically committed. She and nature are one. She is an artifice, but she lives with it in harmony. She tells Giovanni that she "grew up and blossomed with the plant and was nourished with its breath. It was my sister, and I loved it with a human affection" (Hawthorne, 2017, p. 482). Beatrice's artificial condition isolates her from natural and social interactions with mortal human beings. She defends herself by saying this to Giovanni: "Though my body be nourished with poison, my spirit is God's creature, and craves love as its daily food." (Hawthorne, 2017, p. 483). As evidenced by her last words to her lover as she is dying, the young woman accepts her mixed condition,: "Farewell, Giovanni! Thy words of hatred are like lead within my heart; but they, too, will fall away as I ascend. Oh, was there not, from the first, more poison in thy nature than in mine?" (Hawthorne, 2017, p. 485). Beatrice has almost all positive biophilia characteristics, particularly the aesthetic, ecological-scientific, humanistic, moralistic, naturalistic, and symbolic traits. Her moralistic awareness and sacrifice reflect her ethical attitude in protecting others, particularly Giovanni, from her father's machinations, owing to the harm caused by her poisonous condition. Borrowing from Kellert's concept, we can say that Rappaccini's daughter is, ironically, a victim of all male characters whose dominionistic, ecologic-scientific, symbolic, utilitarian, and negativistic traits outweigh her aesthetic and ethical traits.

Finally, we conclude that the characters' fascination with science, their alienation from nature, and the impacts of disrupting the natural order resonate with the unwise use of or overreliance on AI that negates human potential.

CONCLUSION

We have shown that reading the classic nineteenth-century fiction may shed light on today's potential consequences of human actions in rising above natural limitations, whether through science, art, or intellectual pursuits. Fascination with science and alienation from nature disrupts the natural order. Nathaniel Hawthorne is known for consistently presenting moral allegories in which people suffer the repercussions of their prideful manipulation of nature. Revisiting *Rappaccini's Daughter* through the lens of ecopsychology, this article reveals that excessive scientific pride can lead to environmental harm. Our finding proves that Hawthorne is forward-thinking and cautious about the danger of reshaping nature according to human design and desire.

The short story discussed can be seen as a critique of the uncomfortable relationship between environmental ethics and artificial creation. The male characters in *Rappaccini's Daughter* are detached from nature and have a sense of human self-importance, whereas the female figure is not biophobic. We now contend that Beatrice is a biophilia due to her close relationship with nature. Nevertheless, her hybrid condition, which is both fascinating and frightening, resembles the blurred line when humans' creativity and agency are lost to AI's growing capability.

We have also shown the story's further parallel with contemporary technological society. Dr. Giacomo Rappaccini's lack of intimacy with nature uncovers his dominionistic attitude toward nature, which is shown by his controlled-garden setting and plant experimentations or what would have been called genetic engineering today. Professor Pietro Baglioni, who admires and despises Rappaccini, is scientific and brilliant, but his egotism and pomposity have proven fatal. Baglioni's action is similar to the unreflective use of AI. His non-natural intervention via antidote he created demonstrates his skepticism of the normal biological process. Giovanni Guasconti represents doubts and the loss of something important, just like modern people who blur the line between natural and artificial entities. The character of Beatrice Rappaccini can be seen as a metaphor for human-AI interactions. Her artificial condition prevents her from normal human interactions. Rappaccini's botanical experiments are analogous to the artificiality of AI systems that impersonate human intelligence. The manipulation of nature uncontrollably in the short story is comparable to unethical AI (over)use, which may cause damaging results. Dark Romanticism forecasts the modern-day consequence of unscrupulous AI use, which could detach true human experiences, competence, conscience, and compassion. Rappaccini's alienation from the object of his invention resembles humans' estrangement from unchecked AI innovations by multinational tech corporations. Reading classic literature from the late 1800s that depicts nature as an artifice can have a profound impact on today's AI-driven world. Parallels can be drawn between the conflict between the natural and artificial expected in the past and the role of AI in shaping the current reality. We ascribe the finding to the dual and compatible perspectives used herein, i.e., Dark Romanticism and ecophobia, which reveal the oscillating fear and fascination in humans throughout history.

To conclude, *Rappaccini's Daughter* implies that the development of AI should be approached with humility, ethical deliberation, and an understanding of human limitations. Understanding and appreciating the intricate relationship between humans, science, and nature is vital to fostering an ethic of care, conservation, and respect for the environment in the modern world.

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