Literature, Language and Cultural Studies
ISSN Print: 3079-5095
ISSN Online: 3079-5109
https://doi.org/10.63313/LLCS.9136

Cyborg Bodies and Identity Reconstruction in the Post-Apocalyptic Novel *The Wind-Up Girl*

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How to cite this paper: Jin, Y. M., & Cheng, X. F. (2026). Cyborg Bodies and Identity Reconstruction in the Post-Apocalyptic Novel The Wind-Up Girl. *Literature, Language and Cultural Studies*, 4(2), 34-43. ISSN Print: 3079-5095; ISSN Online: 3079-5109.
https://doi.org/10.63313/LLCS.9136
Published: 2026-02-28

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Abstract

This paper analyzes the construction and alienation of cyborg bodies and identities in Paolo Bacigalupi's post-apocalyptic novel The Windup Girl. Focusing on the interactions between humans, genetically modified organisms and nonliving matter in the novel, the paper explores how the body transcends its status as a passive object to become a dynamic field participating in power reconstruction in the post-apocalyptic context. The study finds that the body in the novel is a material existence permeated with political, economic and ecological relations, and its deep entanglement with non-human matter not only challenges anthropocentrism but also highlights the core role of the material body in shaping identity and constructing survival ethics. The novel reconstructs the ethical and political implications of the body as an "actor", providing critical insights for reflecting on the drawbacks of global capitalism, building a symbiotic relationship between humans and the material world, addressing ecological challenges and achieving sustainable development.

Keywords

Cyborg; Post-Apocalyptic Fiction; Identity The Windup Girl

1. Introduction

With the rise of technological culture, human-machine hybrids have progressively become a prominent theme in science literature. As early as 1818, British author Mary Shelley's Frankenstein constructed an early vision of artificial life with horrifying undertones through the scientific experiment of an "artificial monster" in Frankenstein. In 1929, the scientific sociologist John Desmond Bernal, in his work The World, the Flesh, and the Devil: An Enquiry into the Future of the Three Enemies of the Rational Soul, proposed the concept of "modifiable cyborg"—a being capable of surviving in vacuum environments and possessing advanced sensory capabilities through biotechnological modification—thus formally introducing human-machine hybrids into scientific research discourse. In 1960, two American scientists first introduced the concept of the "cyborg" in a NASA report, envisioning

the enhancement of astronauts' physical capabilities through mechanical implants or pharmacological reinforcement to adapt to space exploration missions. This term, a portmanteau of "cybernetic" and "organism," referring to a human-machine fusion system embodying both the contradiction and unity between organic life and mechanical devices, while also carrying scientists' visions for a post-human era. In 1985, Donna Haraway published A Cyborg Manifesto: Science, Technology, and Socialist-Feminism in the late Twentieth Century, further introducing the "cyborg" from the perspective of technological design into the field of cultural studies. She endowed it with profound cultural connotations from the standpoint of feminist science and technology studies, endowing the concept with a distinct critical political character. Therefore, This paper seeks to provide insights into such questions as what impact the cyborg body exerts on human self-perception and world outlook, and how humanity can turn crises into opportunities to address the disasters brought about by the development of global capitalism, through an analysis of the bodily representation in the post-apocalyptic novel The Windup Girl.

2. The Cyborg Body: Imagination and Practice of Human-Machine Hybridity

What is human nature, and how do we comprehend the essence of being human? This perennial question remains central to contemporary science fiction narratives. Renowned American philosopher Donna Haraway offers a perspective that fundamentally challenges all answers regarding "human essence." She defines the cyborg as "a cybernetic organism, a hybrid of machine and organism, a creature of social reality as well as a creature of fiction." (Haraway, 2016) She defines cyborg anthropology as a theory for reconfiguring relationships through the examination of boundaries between humans, other organisms, and machines. "Cyborg anthropology attempts to provocatively reconfigure the boundary relations between particular humans, other organisms, and machines. The interfaces between specific humans, other organisms, and machines prove an excellent field site for investigating what constitutes self-acting and collective empowerment. I call that field the culture and practice of technoscience." (Haraway, 2018) Through a series of theoretical and methodological explorations, Haraway challenges traditional anthropology's essentialist stance with relational and connective thinking, establishing cyborg anthropology to reconfigure humanity. This theory of reconfiguring relationships holds significant importance for humanity, currently facing environmental and artificial intelligence crises, to rethink what it means to be human and its position.

In recent years, as a key issue in post-apocalyptic fiction, posthuman discourse has proliferated exponentially within contemporary humanities and social sciences. In a sense, posthuman aesthetics inevitably manifests through bodily dimensions, with this turn towards embodiment constituting the field's core epistemological concern. As Harraway points out in A Cyborg Manifesto, the combination of organisms and

machines gives rise to what we commonly refer to as the posthuman, which entails the recognition of a corporeal existence. It is precisely in recognition of this fact that material-ecological feminist Stacy Alaimo conceives the cyborg as a hybrid of human, machine, and nature (particularly animals). As boundaries between life, machine, human, and animal are traversed, an amplified aesthetics of the body and ecology emerges, providing both theoretical underpinning and a critical framework for the nascent posthuman aesthetic. From this perspective, philosophy and somatics form an interpenetrating dialectical relationship: examining posthuman aesthetics through the cyborg lens allows us to rediscover the political implications and ethical potential of the body.

The post-apocalyptic science fiction novel The Windup Girl (2009) by the American science fiction writer Paolo Bacigalupi responds to this theoretical dimension through its speculative narrative. By narrating the fates of genetically modified lifeforms, the work delves deeply into the reconstruction of cyborg bodies, reflecting on the relationship between humans and non-humans, and the positioning of posthuman individuals within an alienated world. It has garnered numerous accolades, including the Hugo Award and Nebula Award. The story constructs an extreme scenario of posthuman aesthetics: the global fossil fuel system collapses, bio-capitalism monopolizes the right to calorie production, and Bangkok descends into a concentration camp for genetically modified life forms. The narrative unfolds through a power struggle between two Thai domestic security agencies, spawning four intertwining storylines centered on: Anderson, a spy tasked with stealing the seed bank; Kanya, a cold and calculating official; Hock Seng, a refugee; and Emiko, a wind-up girl worked in a sex bar. In Thailand, a wilderness ravaged by global capitalism, the fates of these characters with hidden secrets intertwine, triggering a series of cascading events with a "butterfly effect". This compels profound reflection: when cyborgs descend from theoretical metaphor to disciplinary apparatus of bio-capitalism, when human-machine hybrid cyber-bodies signify not liberation but alienation, what becomes of posthuman possibility ? While exploring future pathways, how might we reconcile the tension between technological revolution and identity reconstruction? Within the post-apocalyptic landscape of Cyborg Girl, does identity reconstruction retain the potential for resistance? Does Emiko's ultimate awakening—her leap from "written object" to "narrative subject"—constitute a form of cyborg politics that resists dualism ?

3. The Alienation and Reconstruction of Cyborg Bodies in The Windup Girl

3.1. Flesh-Technology Coupling: Reconstructing the Cyborg Body

To elaborate on the definition and positioning of the body, it is necessary to draw on the phenomenological concept of the "world". Inheriting Edmund Husserl's phenomenology, Don Ihde posits that the "world" constitutes the very ground upon

which the body can be presented. He contends that "technology constitutes the very mode of our being-in-the-world, not merely as instrumental entities" (Ihde,1990), and that "human beings are bodily entities, entities interpreted within culture, and entities mediated through technology" (Ihde,1990).Through this theoretical approach, Don Ihde posits that this world — as the foundation for bodily presentation—manifests in three forms: the material world, the technological world, and the cultural world. Within these, three distinct bodies are presented: the physical body at the corporeal level, the technological body in its technical sense, and the body disciplined by socio-cultural norms. This theoretical framework provides a crucial entry point for understanding cyborg bodies in post-apocalyptic literature: the flesh, as the material foundation of biological entities, is recoded through technology, becoming a dual terrain for the exercise of power and the resistance to reality.

Firstly, from the perspective of technological modification of biological organisms, Emiko—as a windup girl produced by Mistsuwa Corporation is a paradigmatic case of the profound reconstruction of fleshly materiality by genetic modification technology. The boundaries of her natural body have been breached, giving rise to a genetically modified species possessing distinct characteristics in sensory perception, physical prowess, and appearance. The advent of windup humans represents a new life form cultivated by technological enterprises through gene-editing techniques to modify the human genome. Her body, a fusion of biological essence and technology, possesses both "technological" advantages and inherent flaws: "Her auditory abilities were exceptional—those scientists had not only endowed her with smooth skin and dog-like obedience but also granted her extraordinary hearing" (Bacigalupi, 2009) . In a society dominated by capitalism and patriarchy, scientists crafted the perfect woman to serve the elite. Genetic engineering reshaped bodily kinesthesia and perception, rendering them resistant to illness and fatigue, while deeply intervening in personality formation and disciplinary obedience. Yet, their fleshly construction integrates cross-species genetic technology, endowing them with agility and resistance far exceeding the normal human limits. The forced coupling of retained humanity with inanimate mechanical power, intended to discipline them into instruments of servitude, kindles Emiko's resentment and resistance against the injustice of her fate.

Furthermore, technological rationality perpetually prioritizes efficiency, control, and maximization of productivity. Under this logic, humans are engineered into windup automatons, and animals fare no better. Genetic editing techniques have produced numerous alienated species, most notably the resurrected and genetically modified mammoth. In the novel's post-oil-depletion world, humanity relies on bioenergy for survival. These mammoths are chained to main shafts, driving industrial flywheels. Biotechnology endows them with supernaturally massive frames and strength, enabling them to fuel industrial production or be transformed

into brutal war machines. Yet under technological domination and human control, animal life is reduced to an object. Humans abuse and inflict violence with impunity, solely to serve their own ends.

Both Emiko and the mammoth are essentially pitiable creatures of technological alienation—objects stripped of agency and soul. As a genetically modified 'windup girl', Emiko was deliberately engineered to possess both human sensory capabilities and absolute obedience. This contradictory design makes her acutely aware of her instrumentalized condition through her retained bodily perception when subjected to inhumane treatment, ultimately igniting her resolve to resist. The resurrected and modified mammoths, on the other hand, are tightly bound by iron chains and elephant whips in industrial production and war machines, reduced to biological resources for providing power and violence, their dignity as living beings completely erased in the pursuit of efficiency dictated by technological rationality. Their fates are identical: scientists and managers attempt to fully control life through technological means, yet become desensitized under the dehumanizing logic of technology, ultimately leading to violence and abuse against life. Emiko's awakening and the mammoth's rebellion both point to the same truth ——technology may freely alter the structure and form of living beings, but it cannot erase their autonomy and existence as subjects of life. This serves as a warning: the cybernetic fusion of living beings and technology may spur a re-examination of nature and life, yet technology has inherent limitations. Any attempt to completely instrumentalize life will ultimately trigger an uncontrollable backlash.

3.2. The Reconstruction of Identity Perception Within the Cyborg Body

The core attributes of the cyborg lie in its hybridity and indeterminacy, subverting traditional boundaries between mind and matter, machine and nature, and gender identity. Thus, the technological reconstruction of the human body by cyborg technology also triggers a profound predicament of self-identification (Qiu,2025). The novel depicts a post-calorie catastrophe Thailand where political corruption and transnational capital run rampant. Technological transformation fails to form a positive synergy with social order, but instead exacerbating systemic contradictions. After technology reshapes bodily forms, society still adheres to backward order logic, oppressing underprivileged women into windup slaves, imposing patriarchal hierarchy to oppress them, while relegating genetically modified clockwork humans to society's lowest strata. Two political factions jostle for power and profit, disregarding the livelihood of the grassroots, and shift the costs of their struggle through resource competition and policy games. Marginal groups such as windup humans and fugitive refugees are exploited both by the corrupt government and trapped in the cracks of survival due to political conflicts, repeatedly victimized in the maelstrom of political struggle and becoming sacrificial lambs for capital's profit-seeking. The contradiction between this political lag and technological development ultimately manifests itself in the marginalized social groups.

The identity recognition challenges faced by genetically modified organisms such as Emiko in the novel profoundly reveal the cognitive predicament under the cyborg bodies: she is designed as a tool for others' service, forced to meet others' demands by an unattainable standard of perfection. After her Japanese owner discarded her to save the cost of a single plane ticket, Emiko's fate devolves into that of a despised windup monster. This abrupt identity transformation and inherent contradiction stem from alienation of capitalist society, and more deeply, from the individual's cognition of their technologically regulated identity. Her view of service as a means of self-actualization reflects a misalignment between gene-editing technology and the structure of labor market structures. Conscious of her perceived "flaws", she sees service as an opportunity for self-transcendence, seeking to transform from a marginal identity to a "real human being". As French philosopher Michel Foucault observed in Discipline and Punish: The Birth of the Prison: "Discipline does not merely stem from external authority; it originates from our inner self-discipline. Liberation, therefore, arises from the reconstruction of self-identification." (Foucault,1977).

Society imposes systematic exclusion and exploitation on genetically modified organisms such as cheshires and windup humans, as well as traditional vulnerable groups including refugees. Within this social context, distorted perceptions of marginal groups gradually solidify, transforming into brutal disciplinary mechanisms. These manifest as resource deprivation and rights restrictions at the economic institutional level, while permeating the cultural and conceptual level, forming a dual squeeze on the living space of marginal groups. Genetically engineered new species reveal an epistemological paradox in the context of posthumanism: the designation "new" does not stem from recognition or reverence for novelty, but is rather a means by which human society motivates genetically edited life forms to serve human interests. The concept of "new humans" lacks clear definition; its opaque connotations indicate they are inherently subject to arbitrary definition by society and capital.

Under the manipulation of discursive strategies and biotechnological, the essence of "service" embodied by Emiko fundamentally revolves around the pursuit of a fictional ideal state of a "new human". This quest for identity recognition constructs a superficial harmony, yet in reality, it is fraught with profound alienation. At the end of the novel, the liberated Emiko engages in a theoretically profound dialogue with Gibson, the maverick scientist. As an eminent genetic editing scientist, Gibson acknowledges Emiko's physiological superiority while offering limited validation of her existential worth: "You surpass humans in nearly every respect. You are faster, more intelligent, with superior vision and hearing. Though bound by human commands, you remain immune to illness unlike us mortals. (Bacigalupi, 2009) " Gibson's evaluation accurately reveals the dual positioning of the posthuman in the order of technological capitalism: they are both superior beings "optimized" by

genetic technology and instrumental objects firmly controlled by humans. Gibson also tells Emiko not to be ashamed of her stuttering defect. The technological barriers facing windup humans—such as reproductive difficulties and limb stuttering—are not insurmountable. As long as their longing for freedom and dignity can transcend the instinct of obedience and the fear of death, the dominant order of anthropocentrism will ultimately face a fundamental challenge, and an era when posthuman subjects break through technological, legal and ethical constraints may eventually arrive. As a biological "new human", Emiko finally lets down her guard against Gibson and takes the initiative to ask if he can help her reproduce, hoping to enable the windup humans as a "new biological species" to gradually become part of nature. This choice echoes Gibson's words: "Someday, maybe all humans will become new humans. Then when you look back at us, we'll seem as pitiful to you as Neanderthals seem to us now" (Bacigalupi, 2009).

4. Transcending the Predicament of the Cyborg in Reality

4.1. Technological Turn: From the Hegemony of Instrumental Rationality to the Reconstruction of Bodily Subjectivity

Within the theoretical framework of posthumanism, the reconstruction of cyborg identity does not entail a radical rejection of technology. Rather, it relies on a renewed understanding of technology's essence, the deconstruction of power structures, and the establishment of symbiotic ethics. This provides a systematic practical framework for the identity breakthrough of living subjects in the technological era, while also charting the core direction for the construction of order in posthuman society. Just as Francesca Ferrando points out that: "the posthuman deconstructs the clear division between life/death, organic/synthetic, and natural/artificial." (Ferrando,2019). Technology not only reshapes life's material form but profoundly reconfigures subjectivity and its position within society. The core of this technological alienation lies in instrumental rationality's dissolution of life's essence and its absolute dominance over technological practice. Beneath this lies the deeper forces of capital and societal control and exploitation.

Martin Heidegger defined the essence of modern technology as the "Gestell" (framework). Within this framework, all living and natural beings are "bestellt"(challenged forth) into controllable, quantifiable, and expendable "Bestand" (inventory).(Heidegger,1977). This signifies that all beings, whether plants, animals, humans, or genetically modified posthumans, their intrinsic value and life subjectivity are utterly dissolved, reduced to tools serving capital accumulation and power control.The explicit division between human beings is precisely reinforced and solidified within this process. This technological alienation is particularly prominent in the era of global capitalism: the value of the body is entirely determined by its adaptability to capital accumulation. Bodies that can directly serve capital expansion are incorporated into the core of the community,

enjoying resources and recognition; those unable to generate immediate benefits and are deemed "useless" are excluded to the margins, even subjected to contempt and expulsion. This process represents the ultimate instrumentalization—humans are no longer the end of existence itself, but reduced to consumables for capital to control and extract surplus value. The body, which ought to be the vessel for life experience and sensory engagement with the material world, is distorted into a appendage of capital under the logic of capitalism, becoming an object of discipline and modification.

However, when we re-examine the essence of the body and reveal its nature as both a material existence and a symbolic carrier, we may break the disciplinary shackles imposed by capital. As the novel demonstrates, the body is not merely a passive adherent to the logic of capital; it can resist external technological modification and forced adaptation through its inherent material and biological attributes—such as desire, perception, and vitality. Furthermore, the genetically modified posthuman body can reconstruct its existential significance through autonomous practices and expressions. In this process, the material body attains ontological status, ceasing to be a battleground for alienated labor and consumerism, and instead becoming a site for self-actualization and meaning-making. As Emiko in The Windup Girl acutely experiences the shame of inhuman treatment, these complex emotions not only awaken profound reflection on her own fate but ignite her resolve to resist. In this moment, she ceases to be a tool serving others and instead becomes a window through which she perceives the world, feels pain, and awakens to self-awareness. The body shaped by trans-corporeal technologies can function both as instruments of control and as vessels for resistance.

4.2. Protest against anthropocentrism and binary oppositions

Anthropocentrism and dualistic thinking constitute the deep-seated ideological roots of technological alienation and the cyborg identity dilemma. Since the Enlightenment, anthropocentrism has placed humanity at the center of the cosmos, disregarding the intrinsic value of non-human life and nature. This mindset has been further reinforced by the rapid advancement of artificial intelligence, biotechnology, and nanotechnology. In other words, while reaping technological benefits, people unconsciously treat technology as a tool serving human interests. By establishing hierarchies and manufacturing distinctions, this approach legitimizes systemic oppression, pushing cyborgs to the marginal position of "alien entity" and making them the objects of exclusion and exploitation.

The narrative text of The Windup Girl deconstructs such anthropocentrism and dualism from start to finish. The work reveals humanity's potential to rediscover the agency of non-human life. This interspecies empathy forms the core of symbiotic ethics: it demands humanity abandon "single identity standards," embrace identity's fluidity and diversity, and acknowledge the equal value of diverse life

forms—natural humans, cyborgs, genetically modified animals. Simultaneously, it calls for establishing cross-species communication and empathy mechanisms, enabling different life subjects to understand and respect one another, seeking symbiosis in difference and achieving harmony in diversity.

Human lives in a vast and complex relational network, which constitutes the concrete perception of the community of shared future for mankind. The networked image endows the same reality with multi-layered dimensions of understanding, "where this polysemic reality, like a sponge, manifests as a vast porous grid existence, within which all life forms exhibit initial self-circulation and communicate through internal relations" (Iovino,2014). As the narrative subject of literature, cyborg life forms deconstruct traditional human self-cognition, and at the same time, guiding humanity towards reflection on its essence through diverse self-roles. They sketch a vision of multiple species coexisting within both difference and unity. Within this narrative framework, the self becomes pivotal for humanity to reassess its relationship with other species, forming a symbiotic pattern where diverse species are both interdependent and distinct. When we delve into narratives of human-nonhuman encounters, our aim is to stir profound empathy within readers, thereby deepening their grasp of the inextricably linked destinies of all beings. This is not a negation of the human subjective position, nor an advocacy of a return to the tradition of extreme anthropocentrism, but rather an assertion that humans need to establish a sense of "centrality": not greedy seizure or hierarchical possession, but the full practice of ethical and political responsibilities to the common collective as a member of all things. In the interconnected relationship of all beings, humans must rethink: what can we do as humans, and what should we do? It demands that humans abandon the traditional obsession of "conquering nature" and establish a holistic ecological values. The posthuman subject, on the one hand, interacts with non-human life forms in an open, interconnected and diverse cross-species becoming, thus gaining a global space.

5. Conclusion

Science fiction transcends the limitations of the real world, constructing technological scenarios and imaginative spaces beyond human experience to reveal potential futures and expand cognitive boundaries. The reconfiguration of identity within the cyborg horizon fundamentally re-establishes humanity and non-human life as a "relational existence" – where no life form is an isolated, self-sufficient entity, but rather acquires its identity and meaning through continuous interaction and connection with others, the environment, and technology. In the posthuman world of The Windup Girl, identity is not innate, essentialized entity but a dynamically shaped by the interplay of technology, power, and ecology. The cyborg identity is not an inevitable consequence of technological advancement but arises from the combined effects of instrumental rationality's hegemony, hierarchical

power structures, anthropocentrism, and dualistic thinking.

The post-apocalyptic vision of The Windup Girl serves both as a profound warning against contemporary technological abuse, capitalist expansion, and ecological crisis, and as a multifaceted imagination of a posthuman future. The novel's core vision ultimately conveys that posthuman is not an 'alien entity' in apocalyptic scenarios, but rather a reimagining and extension of the concept of life within the modern technological context. The ultimate value of the posthuman era lies not in 'new species supplanting old humanity', but in enabling every life form to attain dignity and freedom, compelling humanity to re-examine its place within the cosmos. True technological progress relies on balancing humans with technology, nature and society. For posthuman civilization, humans must abandon hegemonic thinking and embrace pluralistic symbiosis to escape technological alienation, while cyborgs need to break identity shackles and awaken subjectivity to master their destiny. This "human-cyborg-nature" symbiosis is the ultimate goal of cyborg identity reconstruction and the core direction of posthuman civilization, embodying the practical significance of Haraway's cyborg theory: breaking dualism through cross-boundary imagination and practice for a more inclusive, equal and sustainable new civilization.

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