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Danielle Collett December 7, 2021

Neurodivergence in Science Fiction: Identity, Ethics, and Technology as a “Cure”

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Abstract

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This thesis investigates the representation of neurodivergence in two science fiction novels, Daniel Keyes’s *Flowers for Algernon* and Elizabeth Moon’s *The Speed of Dark.* Both novels explore similar themes of using advanced neurotechnology to “cure” the novels’ protagonists of their respective disabilities, thus raising ethical questions regarding the efficacy of such experiments and what they suggest about curing disability. Further, this work analyzes how Moon’s novel directly responds to Keyes' by deconstructing some of the stereotypes arising in *Flowers* and questioning the idea of normalcy and conformity within society. These novels use neurodivergent narration to guide their stories, creating new ways of understanding and interpreting different lived experiences. Thus, this thesis examines how science fiction novels can function as powerful media for exploring different forms of human thought, identity, and experience.

Together, *Flowers* and *Speed of Dark* serve as case studies to (i) delve deeper into how science fiction provides a lens to understand neurodiverse experience, (ii) raise awareness about the ways in which society continues to perceive disability, and (iii) confront stereotypes that continue to pervade society today. These case studies examine the neuroethical implications of the neuroscience research represented and explore how these artistic works of literature contribute to knowledge in ways that benefit the scientific community and society at large. Thus, an analysis of *Flowers for Algernon* and *The Speed of Dark* considers both the possibilities and consequences of experimental research—specifically neurotechnological advancement—and ultimately, how fictional works of literature can contribute to scientific discipline.

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Introduction

My Introduction: The World of Science Fiction

My very first love was science fiction. As a child, I remember pouring myself into the world of science fiction. I would stay up late at night, buried under the covers with a small, pink flashlight in one hand and a great work of fiction in the other. The reading continued until the sun began to peek through my bedroom's white, shuffled blinds. Only then would I let the ideas of the stories lull me to sleep, allowing my mind to wander and consider new, reimagined story endings. During the day, I would hide in my fort, constructed with mismatched living room chairs and stolen linens from the nearby closet. The fort became my place of solitude, an escape from reality, and the books I read in it became my home. Within the world of science fiction, I could be anyone, traveling through space and time to explore new, imagined realities of existence. The fort was my own, personal time machine, transporting me from the book burnings of Ray Bradbury's *Fahrenheit 451* to the alien invasions of H.G. Wells's *The War of the Worlds.* Reading works of science fiction was more than a pastime; it became a secret world for me to explore new ideas, possibilities, and identities.

As I grew older, my love for science fiction only strengthened. I began to think more deeply about the way in which science fiction inspired my thoughts. I often found myself writing my own, short science-fiction stories. My biology and chemistry classes became my inspiration. In class, my mind would wander as I thought about how new biochemical reactions could create new beings, new life forms, and new realities. As my once linen-covered fort transformed into classroom settings, I began to understand how these short stories could actually become their own experiments. Before school, I would read (and continue to read) about new, cutting-edge technology in the science section of *The New York Times* and *The Wall Street Journal.* As

science continued (and continues) to advance, I couldn't help but think about the new ways in which science could create miraculous inventions or, of course, go horribly wrong. My short stories explored all imagined possibilities. For most of middle and high school, the stories I created remained my own, and like a mad scientist, I kept my experimental stories locked away.

It wasn't until my sophomore year in high school that a boy in my Algebra 2 & Trigonometry class asked what I was reading (instead of doing the math homework, of course). I lifted up my book to reveal *Delirium* by Lauren Oliver, a dystopian science fiction-romance novel where love is viewed as a disease that must be cured. When I explained the plot, I acknowledged my passion for science fiction novels even if this one had a bit of predictable romance in it. He nodded in agreement, but said "I like it too, but it's hard to relate to the characters in those kinds of books." I didn't understand what he meant until he explained he was considered "high functioning" on the autism spectrum, which explains why I probably never noticed that he was autistic. At the time, though, I was unfamiliar with the specifics of what classified someone as "high functioning," and I immediately wondered how it would feel to categorize oneself as "low functioning" or any level of "functioning," for that matter. The conversation that day stuck with me for a long time, but it wasn't until I read Mark Haddon's *The Curious Incident of the Dog in the Nighttime* during my junior year in college that I truly began to understand the weight of my friend's words.

As I thought more about my love for science fiction, I considered what kinds of characters, protagonists, and narrators were often featured in the stories. I realized that most of the science fiction I had read, up until that point, was largely written by neurotypical individuals and featured only neurotypical protagonists. In fact, after reading *Curious Incident,* this honors thesis began as an ethical investigation of whether neurotypical authors have the right to write

about neurodiverse characters, and if so, how much research should they have to do? However, as I searched for more novels featuring neurodiverse narrators and protagonists, I found myself re-reading Daniel Keyes' *Flowers for Algernon* and I began to think differently about my research. I needed to take a step back and first begin with an exploration of how readers understand current works featuring neurodiverse individuals. I wondered how the neurodivergent experience was depicted, and further, *what* science fiction, a genre I had always held close to my heart, *accomplished (or did not accomplish)* for the neurodiverse experience. Did it reinforce stereotypes of neurodiverse people? And if so, which stereotypes? I began to wonder how the artistic goals of these novels aligned with consciousness-raising about the neurodiverse community, and further, what could science learn from this literature?

There also exists an important, cultural moment for this thesis with the neurodiversity movement, the rise of disability studies, and the increasingly engaged conversation surrounding how fiction can help perpetuate or eliminate existing stereotypes of disability. It is helpful to discuss each of these areas briefly to better understand their relevance and cultural importance to this project.

Neurodiversity, a relatively new concept, was originally a movement among individuals labeled with autism spectrum disorders (ASDs) who wanted to be seen as different, not disabled. The neurodiversity movement argues that diverse neurological conditions are results of normal variations in the human genome. In *The Power of Neurodiversity,* author Thomas Armstrong, an Executive Director of the American Institute for Learning and Human Development explains the essence of neurodiversity as follows:

> The concept of neurodiversity provides a more balanced perspective. Instead of regarding traditionally pathologized populations as disabled or disordered, the emphasis in

> neurodiversity is placed on *differences.* Dyslexics often have minds that visualize clearly in three dimensions. People with ADHD have a different, more diffused, attentional style. Autistic individuals relate better to objects than to people. This is not, as some people might suspect, merely a new form of political correctness (e.g., "serial killers are differently assertive"). Instead, research from brain science and evolutionary psychology, as well as from anthropology, sociology, and the humanities, demonstrates that these differences are real and deserve serious consideration. (6)

Although the term "neurodiversity" has only been around for about 20 years, it has created new ways of thinking about disability and society. Neurodiversity has raised questions surrounding what defines an individual's success in a particular environment or societal setting. People are forced to live in today's fast-paced world, which requires them to be social, follow rules and social norms, think rationally, and conform in other distinctly defined ways. Consequently, a crucial part of being successful in the world relies on adapting to the environment we are given (this leads us to the idea of niche construction, which will be discussed in greater depth in the next chapter). But what happens when that environment is only inclusive for a certain kind of population, a certain group of people? Does the exclusion of a particular group inherently make that group "disabled"?

The exclusion of particular groups due to environmental construction and pressure to conform to societal "norms" creates further stigmatization and stereotypes for people with disabilities. For individuals with autism, such stereotypes range from being classified as individuals who are incapable of possessing a theory of mind or showing empathy to being categorized as "autistic" savants when demonstrating high levels of intelligence and mental acumen in certain areas. For other forms of mental disabilities, such stereotypes include showing

a lack of intelligence (for cognitive disabilities), the inability to succeed in social interactions, and the incapacity to develop relationships with others. These stereotypes are harmful and pervasive across literature, media, and society. Disability studies works to combat such stereotypes, as it asserts that disability is not an individual defect but rather the product of social justice. In Dr. Tobin Sievers' book, *Disability Theory,* he articulates the key focus of disability studies:

> Unlike the medical approach, the emerging field of disability studies [...] is not one that requires the cure or elimination of the defective person but significant changes in the social and built environment. Disability studies does not treat disease or disability, hoping to cure or avoid them; it studies the social meanings, symbols, and stigmas attached to disability identity and asks how they relate to enforced systems of exclusion and oppression, attacking the widespread belief that having an able body and mind determines whether one is a quality human being. (3-4)

Disability studies is an academic discipline that examines the meaning, nature, and consequences of disability. It emerged from the disability civil rights movement in the late twentieth century and gave rise to two distinct models of disability: the social and medical models of disability. Early scholarship classifies the medical model of disability as a focus on the physical and mental impairments that exist within individual bodies.

However, scholarship in disability studies has challenged this model and universally drifted toward a more complete acceptance of the social model, which identifies the systemic barriers and social exclusion which make it difficult or impossible for individuals with impairments to achieve their valued functions. Yet, even with this acceptance, there exists pushback on both models as they seek to explain disability universally and by extension, create

totalizing meta-historical narratives that exclude important dimensions of the lived, nuanced dimensions and experiences of individuals with disabilities. This includes (but is not limited to) disability history, theory, legislation, policy, ethics, and the arts. At its broadest, disability studies encourages scholars to value disability as a form of cultural difference.

In many ways, science fiction has been patiently waiting for disability scholars to notice it. Kathryn Allan, author of *Disability in Science Fiction,* argues "the language of futurity is evident throughout disability studies' central theoretical canon as it situates the disabled body in its various temporal locations through the historical treatment of disability" (6). Thus, there is a form of natural affinity that exists between science fiction and the kind of ontological investigation present in disability studies. In science fiction, technology often modifies, supports, and attempts to "make normal" the disabled body or "cure" it of any abnormalities. This leads us to consider, what is normal? And further, *who* qualifies as normal? I argue that normalcy does not have a tangible existence despite how the idea of "normal" has been invested with a great deal of power within society.

Novels, particularly works of science fiction, have notably continued to include characters with disabilities and to place these individuals at the forefront of the novel in narrator-protagonist form. Although representations of disability are ubiquitous, narrative deployments of disability do not confine themselves to representation. There is no singular, universal "representation" of disability, and thus, there is no singular way to depict individuals with disabilities. Disability exists on a spectrum; different disabilities possess different intellectual and behavioral traits, and each neurodiverse individual has his or her own, unique experience with disability. In fact, in the neurodiversity debate there has been a tendency to categorize the

world into two groups: “neurodiverse” and “neurotypical” people. I would argue that this is a false dichotomy and in reality, there are no neurotypical people.

Thus, the purpose of this thesis is not to draw sweeping conclusions regarding the accuracy of how fictional works represent individuals with disabilities because, as discussed, there is no one way (or “correct” way) in which individuals experience their disabilities. Instead, the purpose of this thesis is to analyze the ways in which science fiction novels can serve as case studies for exploring different forms of human thought and experience. This thesis seeks to answer the following questions: How do these depictions of neurodiverse characters challenge or affirm our understandings, and by extension, reinforce stereotypes of disability? What can the field of neuroethics learn from these fictional books? And finally, how can these novels inspire new ways of understanding and experiencing neurodivergence? This thesis aims not only to answer these questions, but to encourage greater collaboration between the scientific community and literary scholars.

To help answer these questions, this thesis will use two novels, Daniel Keyes’ *Flowers for Algernon* and Elizabeth Moon’s *Speed of Dark,* to explore the depiction of neurodivergence in science fiction, the stereotypes constructed and deconstructed, and ultimately, literature’s lessons for science and raising consciousness about neurodiverse experience.

Our Case Studies: *Flowers for Algernon* and *The Speed of Dark*

Before beginning our exploration of the aforementioned topics, it is helpful to provide a bit of background on the two novels of choice. Daniel Keyes’s *Flowers for Algernon* is a science fiction novel that was originally published as a short story in *The Magazine of Fantasy & Science Fiction* in 1959. The novel begins with a laboratory mouse, Algernon, who has undergone a

surgery to increase his intelligence. The story is told through a series of medical "progress reports," written by Charlie Gordon, the novel's cognitively disabled protagonist. Although Charlie's disability remains unspecified throughout most of the novel, it is eventually revealed that he has phenylketonuria (PKU), a rare disorder that can cause severe intellectual disability. Charlie is the first human subject eligible for a surgery that will ostensibly improve his intellectual and social abilities. Initially, the surgery is a success, and Charlie's intellectual abilities improve significantly. In fact, Charlie's intelligence surpasses that of the researchers (Professor Nemur, Dr. Strauss, and Burt). However, Charlie soon notices that Algernon's intelligence begins to deteriorate. Algernon displays erratic and injurious behavior, concluding with his own death. With this foreshadowing, Charlie soon realizes that his own enhanced intelligence will not last, and eventually, he too regresses back to his initial state prior to the surgery. The novel concludes when Charlie decides to institutionalize himself, and his last wish is for someone to remember to place flowers next to Algernon's grave.

Over the years, *Flowers for Algernon* has received much praise from the science-fiction, literary, and television communities. The originally published short story of *Flowers for Algernon* won the Hugo Award for Best Short Story in 1960. The novel *Flowers for Algernon* was published in 1966 and was the joint winner of that year's Nebula Award for Best Science Fiction Novel. The novel was adapted several times, garnering further praise for its accomplishments within the science-fiction community. The 1968 film adaption, *Charly,* was nominated for a range of awards and received "Best Screenplay — Motion Picture" and the film was adapted again in 2000 titled, *Flowers for Algernon (film).* However, both film adaptations also received criticism for the portrayal of Charlie's disability and the emotions it evoked for the intellectually disabled, such as pity and horror. The novel was even adapted as a musical,

premiering in 1978 in the West End theater of London and was nominated for the 1981 Tony Award for Best Original Score.

Throughout his career, Daniel Keyes wrote several other works of fiction, but he continues to remain most well-known for *Flowers,* receiving the Author Emeritus honor by the Science Fiction and Fantasy writers in 2000. In an interview, Keyes remembers his time working to publish *Flowers for Algernon,* which was rejected five different times due to its tragic ending. It has now been published in over 30 countries.

Like Daniel Keyes' science-fiction classic, Elizabeth Moon's *The Speed of Dark* published in 2002 imagines a new medical surgery that has the potential to make profound changes and essentially "cure" the protagonist's autism. But unlike in *Flowers for Algernon,* in *Speed of Dark,* the most important changes occur before the narrative arrives at the medical intervention. The protagonist of the novel, Lou Arrendale, is a bioinformatics specialist with autism who spends his time working on pattern recognition for a pharmaceutical company. However, a new manager at the company, Gene Crenshaw, despises individuals with autism, constantly making derogatory and insensitive remarks about Lou's "abnormality" and "problem." When Crenshaw learns about a new experimental treatment that might "cure" Lou's autism, he coerces Lou (and other employees with autism) to undergo the operation. Although Lou does not believe he needs curing, he spends the majority of the novel debating whether he should participate in the surgery. Throughout the novel, readers also learn about Lou's relationships with others, especially those in his fencing group and subsequently, Lou's penchant and talent for fencing. Eventually, Lou decides he wants the surgery, not because he needs to be "fixed" but rather because he wants to experience a new way of understanding life and the world. The novel ends with a short snippet, seven years into the future post-surgery, where the reader

learns that the operation has worked, as Lou has received his PhD and fulfilled his lifelong dream of traveling to space.

Similar to *Flowers, Speed of Dark* has received much praise as well as criticism from literary scholars, the neurodiverse community, and the general public. *Speed of Dark* won the Nebula Award for Best Science Fiction Novel in 2003 and was also an Arthur C. Clarke Award finalist. It is important to note the Arthur C. Clarke award is one of the most prestigious forms of recognition and literary excellence a science fiction novel can receive. However, *Speed of Dark* has also sparked some controversy with its unexpected ending and Lou's decision to essentially "cure" his autism. Although Elizabeth Moon has written a number of other science fiction and fantasy novels, she reveals her intention for writing *Speed of Dark* was inspired by her autistic son. Through *Speed of Dark,* she hoped to convey an accurate portrayal of her son's experience with autism interwoven with real questions he has asked, such as, what *is* the speed of dark? And is the speed of dark *faster* than the speed of light?

Both *Flowers for Algernon* and *The Speed of Dark* follow similar plotlines featuring neurodivergent storytelling through their first-person narrator-protagonist forms. Through Charlie's progress reports and Lou's internal commentary, the novels successfully bring the reader close to the corporeality of what it might be like to experience the world differently. The novels explore similar themes surrounding the ethical implications of using advanced scientific technology to "cure" disability. Together, the novels question normalcy, humanity, and what it means for a neurodivergent individual to exist in a society focused on conformity. These novels also serve as excellent case studies for investigating whether their science fiction realities and neurodiverse narrative techniques perpetuate stereotypes of disability.

In this thesis, I argue that these novels are not only in conversation with one another, but that Moon's *Speed of Dark* is a direct response to Keyes' *Flowers for Algernon.* Moon's *Speed of Dark* confronts some of the deleterious stereotypes about disability that arise in *Flowers,* and effectively deconstructs such stereotypes with her protagonist's neurodivergent narration. Moon re-evaluates the idea of what it means for someone to be "normal," underscoring that normality is an intangible concept. The plotlines of both novels are similar as well as their characters' relationships with others. In many ways, *Speed of Dark* reads as the thought-process of considering "curing" disability, while *Flowers* reads as a series of consequences for deciding to "cure" disability. As disability studies has evolved, so has its role in science fiction and thus, to a great extent, Moon's *Speed of Dark* provides readers with an experience of disability that *Flowers* cannot, a way to confront stereotypes about disability by deconstructing them while simultaneously pointing out ones that continue to exist in society today.

When I think back to the conversation with my friend during our high school math class that day, I am reminded of how I once only existed within the pages of my books and under the canopy of my blankets. My fortress of covers was the initial incubator to spark my imagination and strengthen my love for science fiction, and I am forever grateful for it. But hiding in the fort does not solve science's problems. To incite change and to progress, I needed to explore and confront the problematic social, political, and scientific realities that exist today. I may have been tucked away in a fort once, but I emerged to study science, challenge stereotypes, and fight for the fair representation of neurodiverse people. The literature that originally turned me inward eventually turned me outward, and I could not be more thankful for that. Here in the open, I can voice my opinion about the ideas that once only existed within the pages of my novels. It is here,

and only here, that I can use my love for science fiction to invent new scientific realities, raise consciousness, and create social change.

With this research, my goal is to delve deeper into the ways in which science fiction provides a lens to understand neurodiverse experience, raise awareness about the ways in which society continues to perceive disability, and confront stereotypes that continue to pervade society today. This project will examine the neuroethics of the neuroscience research discussed in both novels, and finally, explore how these works of literature contribute to knowledge in ways that benefit the scientific community and society at large.

Chapter One: Neurodivergent Narration and Storytelling

Narrating from a neurodivergent point of view constructs a unique niche, creating a story world built on the cognitive perspective of the narrator. The idea of "niche construction" stems from evolutionary biologists, originally referring to the production or remaking of the physical environment to fit an organism's needs. In "Organism and Environment," biologist Richard Levins argues, "Organisms do not experience or fit into an environment, they construct it" (97). The idea of niche construction has migrated to anthropological theory, considering relationships between human evolution and social behavior, and more recently, has migrated into educational theory. One element of niche construction in educational theory describes how classrooms might be redesigned in ways that enable students' neurocognitive differences to become strengths. Neurodiversity educator Thomas Armstrong adapts the idea for practical use in classrooms, proposing several elements of "positive niche construction," including strength awareness, human support networks, and environmental modifications, among others. In fiction, especially science fiction, these elements begin to surface in ways that resonate with biological and educational theories of niche construction in their ability to use different types of narration to guide and construct their stories.

In *Flowers for Algernon* and *The Speed of Dark,* Keyes and Moon use a type of niche construction to build their novels from a neurodivergent point of view. Although *Flowers for Algernon* predates the application of niche construction in education, the elements of niche construction still exist in Keyes' novel. Respectively, Keyes and Moon engage with these elements of Armstrong's "positive niche construction" through their neurodivergent narrator-protagonists. As narrators, the fictional protagonists, Charlie and Lou, create worlds that require

readers to adapt to neurodivergent ways of being. Analyzing each narrator's rhetoric makes this adaptation possible.

Rhetoric, as an art, has been divided into five Greek canons which serve both analytical and generative purposes. In *The Complete Works of Aristotle,* Aristotle articulates the definition and power of rhetoric:

> Rhetoric may be defined as the faculty of observing in any given case the available means of persuasion. This is not a function of any other art. Every other art can instruct or persuade about its own particular subject-matter [...] But rhetoric we look upon as the power of observing the means of persuasion on almost any subject presented to us; and that is why we say that, in its technical character, it is not concerned with any special or definite class of subjects. (2155)

The most relevant canon to explore with respect to the rhetoricity in *Flowers* and *Speed of Dark* is the rhetoric of style. Dr. Gideon Burton's "The Forest of Rhetoric," outlines how rhetorical style concerns "the artful expression of ideas" and focuses on how "to equip one's thoughts with verbal expression appropriate for accomplishing one's intentions" (Burton). Thus, rhetorical figures (a subgrouping within style) are "sometimes taken to represent the whole of rhetoric, the rhetorical figures constitute a vast technical vocabulary naming ways that both ideas and language have been configured" (Burton). Rhetorical figures are particularly essential to rhetoric in that its guiding assumption is that the form or linguistic means in which something is communicated is as much part of the message as is the content. Studying the rhetorical figures both Keyes and Moon employ in their novels provides new ways of thinking about how these characters either possess or lack the capabilities associated with theory of mind. Rhetoric by definition requires types of thinking and abilities that are often considered missing in individuals

with intellectual disabilities and in autists, especially the ability to consider the state of mind, knowledge, and belief of others. Thus, analyzing these novels through a rhetorical lens is productive for analyzing how these characters are represented in each novel respectively.

Keyes and Moon allow readers to adapt to neurodivergent ways of being through the first-person point of view of their narrator-protagonists, rhetorical figures used throughout such narration, and even the structure of the novels themselves. These narrative techniques create a world in which the thoughts, motivations, and feelings of the neurodivergent protagonists become accessible for readers. In this way, narration itself (and in this case, neurodivergent narration) is a type of formal niche construction, as it allows readers to access this created world through language. By creating this niche, the novels ask neurotypical readers to adapt to the neurodivergent storytelling.

Further, beyond the use of rhetoric and structure, Keyes and Moon incorporate other, familiar narratives into their novels. Specifically, Keyes and Moon integrate cultural narratives as well as the retelling of religious stories in their novels. While these cultural narratives differ in *Flowers* and *Speed of Dark* respectively, their incorporation within the novels allows the reader to meditate on the kinds of narratives that have been used for generations yet present new implications in science fiction. In *Flowers,* Keyes confronts the cultural narrative of the overambitious pursuit of knowledge, while in *Speed of Dark,* Moon engages with the cultural myth that people with autism lack empathy. Additionally, the religious story haunts Keyes' novel with the intentional inclusion of Genesis 3, which tells the story of "The Fall" due to the insatiable hunger for knowledge. Moon extends Keyes' inclusion of this biblical story, raising questions regarding how science's advancements complicate the idea of pursuing knowledge to "cure" disability. Taken together, Keyes' and Moon's incorporation of these cultural narratives

and religious recitations, coupled with their structural and rhetorical choices, allow for thought-provoking neurodivergent narratives to emerge in *Flowers for Algernon* and *The Speed of Dark.*

The Role of Structure, Point of View, and Rhetorical Figures

In *Flowers for Algernon,* Keyes physically structures the novel through a series of chronological short journal entries, or "progress reports" that Charlie writes at the request of the researchers. The purpose of these reports is to record the results of the experimental operation and to understand Charlie's mental progression or lack thereof. The presumed audience of his progress reports includes Professor Nemur, Strauss, and eventually, other members in the research in the field who will read the published reports. This is important to note because to some degree, Charlie writes with his readers in mind, eventually deciding to omit some information pertaining to his relationship with Alice. Keyes' decision to construct the novel via Charlie's progress reports is important for two reasons. First, it allows the readers to orient themselves to the time period in which Charlie undergoes the experimental operation and his journey post-surgery over a series of months. The inaugural entry, labeled as "progris riport 1 martch 3" is the first piece of language the reader encounters, and the titular misspelling clues in the reader to the idea that the narration in the novel will be unique and journal-like. The time period of the progress reports starts at the beginning of March and concludes in late Autumn. The seasonal interpretation becomes apparent. Symbolically, there is the resurgence of life and the dying down of life. The progress reports, and Charlie's journey with them, concludes toward the end of Autumn, a season which displays nature's decline. Although Autumn is not representative of death (as symbolized by Winter), it is indicative of the loss of new growth and the beginning of regression. At a certain point, Charlie ceases to label his reports by the month,

solely stating the number of the progress report. This stylistic move by Keyes represents Charlie's detachment from time, as if it no longer matters when Charlie realizes his intelligence will begin to deteriorate.

On an emotional level, Charlie refuses to acknowledge or label the mere months, weeks, or days he has left with his hyperintelligence, and thus the statement of time is removed altogether. On a structural level, removing the acknowledgement of time allows Keyes to blur the readers' understanding of the progression of time as Charlie experiences the challenges of his post-operative self and subsequent intellectual deterioration. Time, like Charlie's consciousness, becomes increasingly fluid as the reader is pulled into Charlie's past and then quickly thrust back into the present. The readers' understanding of time becomes less transparent as some "progress reports" feel as though weeks are passing, while others feel representative of a mere number of hours or minutes. Reality becomes less concrete for both Charlie and the reader as the progress reports vary in time and length throughout. Although Keyes plays with the idea of time using the structured progress reports, time itself becomes symbolic of Charlie's state. At the conclusion of the novel, Charlie's final progress report notes that it is November 21. Further, Charlie's progress reports span the course of nine months, a structural technique that is also representative of the human gestation period. However, at the conclusion of Charlie's nine-month developmental period, no new individual is born. Rather, readers witness a form of "re-birth" as Charlie eventually reverts to his pre-operative self. Although there are differences between Charlie before and after the experimental treatment, they are subtle. He often forgets he had the operation at all, and eventually decides that returning to Warren State Home is the right choice for him to "go somewhere where there are a lot of other pepul like [him]" (Keyes 273). His final mark of cognitive decline is in his inability to continue writing the progress reports. Leading up

to his final report, he writes, “please… please… don’t let me forget how to reed and rite…” (Keyes 273). Yet eventually, the novel’s ending concludes as Charlie has lost the ability to effectively write the progress reports.

The second reason Keyes chooses to structure the novel via progress reports is to illustrate Charlie’s transformation through a medium that presents itself as approachable and accessible for the reader. The progress reports, on a fundamental level, establish a starting point, graph Charlie’s intellectual improvements, and eventually, mark his quick cognitive decline. The epistolary-like form of these progress reports effectively marries the sterile science with humanity. The progress reports serve as a constant reminder for both Charlie and the reader that Charlie is still (in many ways) the experimental guinea pig (or mouse in this case). Charlie can never escape the science post-surgery because his life continues to be narrated in the scientific format. Essentially, science has shaped his way of telling the story. His life becomes the progress reports, which will eventually be given to the research team. And thus, the progress reports (and by extension, his life) are symbolic of the idea that his life will never fully be his own. However, within the scientific presentation of the progress reports lies Charlie’s humanity, the emotional thoughts and feelings that ultimately drive the story, assembling it accessibly for the reader. Further, the progress reports also mirror the narrative and epistolary conventions used in the communication of science during the eighteenth century. In *Communicating Science,* the authors discuss the elements within these scientific journals, specifically their “persistence of narrative and epistolary conventions, the continued presence of the explicitly personal and social in the communication of science, and a continued tolerance for emotional expression” (Alan et al. 69). Thus, the diary-like approach of the progress reports, coupled with the first-person narration, renders the novel personable and sentimental for readers. The structure of the novel ultimately

invites readers to explore Charlie's inner thoughts, frustrations, and change throughout the novel, while serving as an epistolary medium to illustrate Charlie's transformation.

In Moon's *Speed of Dark,* the use of structure ostensibly seems less significant than it is in *Flowers.* In *Speed of Dark,* there are no progress reports, and there is no epistolary approach. Rather, like nearly all works of fiction, Moon's novel presents a series of chapters structured in chronological form. Yet this decision is intentional, as it purposefully removes the science from the science fiction. Lou, unlike Charlie, is not treated as a scientific subject throughout the novel. Lou remains at the forefront, narrating his own story for himself rather than for a group of researchers and scientists. Also, unlike in novels such as Mark Haddon's *The Curious Incident of the Dog in the Nighttime,* where the narrator-protagonist does not explicitly mention his disability and the reader is encouraged to wonder about what his disability might be, Lou announces his autism in the beginning pages. On the second page, Lou cues in readers to autism as he poses the question: "What I mean is what difference does it make if I think of colors as people or people as sticks of chalk, all stiff and white unless they are brown chalk or black?" (Moon 2). And by the fourth page, the reader is fully aware of Lou's autism as he mentions his weekly meetings at the "local branch of the Autism Society" (Moon 4). This explicit mention of Lou's autism throughout the novel is structurally important, as it plays a role in constructing the neurodivergent narrative in such a way that the reader is not forced to view the novel as a medium for "diagnosing" the protagonist or narrator.

In Edgar Schuster's article, "Discovering Theme and Structure in the Novel," he discusses how:

> An exhaustive interpretation is best arrived at through a consideration of the novel's structure, that is, the over- all design of the work. Assuming that the novel

> possesses unity, its structure will serve as a matrix into which all thematic motifs as well as all major incidents and characters will fit. (511)

Essentially, the structure of the novel also contributes to its thematic motifs, allusions, and other narrative elements. In *Speed of Dark,* Moon uses the structural move of beginning and ending the novel with the concept of questions. Interestingly, the concept of these questions does not appear throughout the novel but rather solely in the beginning and ending. In the first lines of the novel, Lou states, "Questions, always questions. They didn't wait for the answers, either. They rushed on, piling questions, blocking off every sensation but the thorn stab of questions" (Moon 1). Moon (via Lou) structures the initial pages of the novel by questioning the questions. The reader, immediately thrust into Lou's mind, has no knowledge of the "questions" asked of Lou, or of what these questions might refer to, only that these questions exist and "stab" at him. In the final lines of the novel, Lou announces, "Now I get to ask the questions" (Moon 340). The final line is powerful, as the novel comes full circle: Lou, who initially begins as the individual questioned, eventually ends as the one who is afforded the opportunity to ask the questions. The novel explicitly opens and closes with the question, "Who knows about whom, and who is thereby authorized to ask questions and validate answers?" (Bérubé 127). The point remains that the novel opens with a Lou who does not understand the larger narrative structuring his life and ends with a Lou who does.

Structurally, Moon bookends her novel with the thought of questions. Yet, this bookending technique still omits the information that constitutes these "questions," leaving the readers to meditate on the purpose of questions in the novel and the role of questions in their own lives. What are the questions we ask ourselves? What is the purpose of questions? And most significantly, *who* is asking the questions? Although the "questions" are not explicitly defined in

the opening and closing lines of the novel, rhetorical questions do appear throughout, a theme integral to the novel's progression while also presenting Lou's thoughts and descriptions in stream-of-consciousness form throughout. In Edward Corbett's book, *Style and Statement,* he argues that rhetorical questions, "can be an effective persuasive device, subtly influencing the kind of response one wants to get from an audience… the rhetorical question can often be more effective as a persuasive device than a direct assertion would be" (Corbett 69). Moon uses both a stream-of-consciousness form and structural bookending to contribute significantly to the novel's overall unity. As in *Flowers,* this unity provides the reader with the ability to access the protagonists' thoughts, feelings, and decisions from the first page to the ending line of the novel. Keyes also makes use of rhetorical questions throughout *Flowers.* In the progress reports, Charlie often wonders who he has become as he experiences heightened levels of intelligence and piqued curiosity about the world. In one instance, he wonders, "What is my place? Who and what am I now? Am I the sum of my life or only of the past months?" (Keyes 137). The rhetorical questions prompt the reader to think about how society viewed Charlie prior to the operation and after it. Although it can be argued that Charlie is in fact the sum of his life, both prior to and after surgery, the interactions between Charlie and other people post-surgery reveal that they did not view Charlie as a member of society prior to the surgery. Together, Keyes and Moon make use of rhetorical questions to further engage with the reader and subtly influence responses from the reader relating to identity.

While both novels remain structurally different, both use a first-person narrator to tell their stories. As James Zborowski writes in his article, "Point of View, Consciousness and Interaction," *"*The study of point of view in fiction is the study of the endless possibilities of the relationship between a fiction's story-world, including the entities within that world, and the way that story-

world is presented to (in fact, and at the same time, created for) the reader or viewer" (Zborowski 7). For Keyes and Moon, this stylistic decision to use a first-person point of view is crucial to understanding and accessing the neurodivergent narratives for three reasons: It builds a relationship between the narrator and reader, expresses the narrator's opinions, and creates intrigue for the reader. Both *Flowers* and *Speed of Dark* are first-person central, meaning the narrator is also the protagonist at the heart of the plot. These narrator-protagonists, Charlie and Lou respectively, are effective (especially in neurodivergent narratives) as their familiarity creates a relationship with the readers. This relationship ultimately allows the readers to fully immerse themselves in the narrative provided.

The first-person point of view builds rapport with readers by sharing as it shares the narrator's personal story directly with the reader, creating a common space between the two. In *Flowers,* the relationship between Charlie and the reader grows in moments when Charlie expresses vulnerability: "But even as I write these words, something inside of me shouts that there is more. I'm a person. I was somebody before I went under the surgeon's knife. And I have to love someone" (Keyes 60). Through Charlie's person-first narration, the reader by extension feels their own "insides" begin to twist as Charlie divulges his innermost thoughts. A similar relationship builds between the protagonist and reader in *Speed of Dark* when Lou uses anecdotes to invite the reader into his mind and life. Lou writes, "What I wish is that I could go out and look up at the stars. My parents took me camping in the Southwest; I remember lying there and seeing all the beautiful patterns, patterns that went on and on forever… I would like to see the stars again" (Moon 40). The anecdote is a simple one, as it shares Lou's experiences with the patterns of the stars. Yet embedded in this short anecdote is a creative technique: Moon uses Lou's point

of view to discuss a vast topic (outer space) while simultaneously bringing the reader closer to Lou, into a shared mental space created through the anecdote.

In *Flowers* and *Speed of Dark,* the central first-person point of view allows the reader to access the thoughts and opinions of the neurodivergent protagonists. It is interesting to consider how the reading experience would differ if the narration were, instead, third person and the potentially harmful impact this would have on how the reader would then view the protagonists. A third person narration would construct more separation (between readers and protagonists) as it would create the potential for objectification as the protagonists could become objects rather than subjects. In an interview with *Publishers Weekly*, when Moon was asked about how long it took her to write *Speed of Dark,* she responded: "At first, I tried to do the conventional third-person narrative past (the way I've done all my other books), but that didn't work. It began to work only when I went into first-person present tense" (Moon). Thus, it is clear that to successfully bring Lou's voice to the forefront of the novel, first-person narration was needed. However, it is important to note that the neurotypical narration of a neurodivergent character can lead to problematic implications in the construction of how disability is constructed, viewed, and perceived. To avoid this conundrum, Keyes and Moon use the first-person point of view and by doing so, allow the reader to continuously access Charlie and Lou's thought processes, opinions, and desires. In *Flowers,* when Charlie realizes his fate will be similar to Algernon's, he expresses his inclination to visit the Warren State Home and Training School. To the reader, Charlie explains that he must, "find out who I really am—the meaning of my total existence involves knowing the possibilities of my future as well as my past, where I'm going as well as where I've been" (Keyes 153). Here, as in many other instances throughout the novel, the reader is afforded an explanation of Charlie's decisions through the careful first-person narration. This phenomenon

is even more present in *Speed of Dark,* as Lou returns to his contemplation on the meaning of "normal" and his own view of autism. In one moment when Lou considers the experimental surgery, he ponders who he is now and who he would have been without his autism:

> If I had not been what I am, what would I have been? I have thought about that at times. If I had been that child, instead of myself, would I have learned math so easily? Would the grated complicated constructions of classical music have been so obvious to me at first hearing? It is harder to imagine a different self now that I am an adult… My iterations were real, immutable, thick black lines that outline my life. The only role I play is normal. (Moon 151)

Lou speaks to the reader, using rhetorical questions to further his own thinking and also to further the thinking of the reader. Lou's point of view allows the reader to sit in Lou's mind and become an active participant in the decision-making process. In *The Rhetoric of Fiction*, literary critic Wayne C. Booth discusses how the ability of narration to represent human consciousness and questioning is an important topic within studies of literary point of view (Booth 54). In the same vein, "how the minds of sensitive, intelligent individuals are forever analyzing, interpreting, anticipating, suspecting, and questioning their own motives and those of others" (Zborowski 8) plays a critical role in the readers' ability to access these mental states of the narrator-protagonists.

As both novels use central first-person narration, they consequently use the pronoun "I" throughout, an important rhetorical move. There are many benefits to using the personal pronoun "I," as it creates an intimate relationship between the narrator and reader. In her book, *Rhetorical Style: The Uses of Language in Persuasion,* rhetorician Jeanne Fahnestock discusses "the most obvious advantage of *I* is its use in personal testimony… when an argument deploys personal

experience, first person narration with *I* is an inevitable choice" (280). In *Flowers* and *Speed of Dark,* the authors use "I" for the voices of Charlie and Lou to position their personal experiences at the forefront of their novels, respectively. Additionally, the "I" in both novels provides the narrator-protagonists with agency and autonomy to tell their own stories, an affordance that has been historically uncommon for neurodivergent individuals. In Norman Friedman's journal article, "Point of View in Fiction: The Development of a Critical Concept," he further contributes to the impact of "I" in the novel. He writes, "the protagonist-narrator is limited almost entirely to his own thoughts, feelings, and perceptions. Similarly, the angle of view is that of the fixed center" (Friedman 1175-1176). Although this idea introduces some of the drawbacks and limitations of using first-person, it also highlights the strength of the first-person, as the reader is able to experience the narrator's thoughts and feelings throughout. The use of "I" throughout these science fiction novels ensures that Charlie and Lou remain at the "fixed center" of their own narratives. There is no room for speculation in how they feel in any given moment because they tell the reader, ultimately narrowing the gap between the readers' consciousness and their own.

Moon and Keyes' construction of their first-person narrator-protagonist points of views also create intrigue by lack of dramatic irony for the reader, ultimately strengthening the relationship between the reader and protagonist. The first-person perspective limits the reader's access to information, as the reader only learns and experiences with the narrator. In *Flowers,* there is no dramatic irony, as the reader discovers Charlie's fate as Charlie himself observes Algernon's erratic behavior, not a moment sooner. Similarly, in *Speed of Dark,* Lou finally solves the mystery of the continuous car vandalisms when Don confronts him. Although the reader suspects the vandalisms are Don's doing, the information is not confirmed until Lou faces

Don in the parking lot. Although this aspect of point of view is less critical to the expression of the neurodivergent narrative, it remains an important aspect of the novels' plots and ultimately affords the reader with the opportunity to identify with the characters, who are learning with them in real time. The one exception of this first-person narration is the presence of the close third-person perspective present in *Speed of Dark* through the viewpoints of Pete Aldrin (his manager) and Tom (the leader of the fencing team). Occasionally, the reader experiences intermissions in which Aldrin shares information with the reader about Section A and the company's (or more accurately, Mr. Crenshaw's) decision to force the employees with autism to take part in the surgery. The reader experiences intermissions in which Tom discusses his thoughts on Lou's decision to "change" and undergo the operation. As Michael Bérubé, a literary scholar in disability studies, suggests in his book, *The Secret Life of Stories,* the purpose of these intermissions is because, "Unfortunately, the question of whether Lou, an adult with autism, understands what is happening at his workplace (and to his life) proves so difficult to handle that Moon must resort to episodic "breaks" narrated by a traditionally omniscient narrator, focalized through neurotypical characters" (126). These intermissions provide the reader with a different lens through which to view Lou, and they also allow access to new information that remains largely hidden from Lou.

In crafting rhetorical style, Keyes and Moon support the macrostructure of what they have accomplished in their structural and narrative choices. Throughout both novels, *Flowers* and *Speed of Dark* incorporate a variety of rhetorical moves to further the neurodivergent narratives. In *Flowers,* Keyes uses the rhetorical technique of metaphors in multiple instances. When Charlie realizes his heightened cognitive state is declining, he considers his future self in the Warren State Home and decides he wants to visit it. When Professor Nemur expresses his

shock and disapproval, Charlie describes Nemur's reaction, "As if I were ordering my coffin to sit in before I died" (Keyes 153). Here, the metaphor Charlie uses equates his cognitive decline to that of death, and visiting Warren is the equivalent of accepting his cognitive "death" before it happens. Charlie attributes this metaphor to Nemur because he believes that without his intelligence, Nemur will cease to view him as a useful, contributing member of society. Fahnestock argues that, "a metaphor need have no previous or easily categorized link to the words it replaces or joins. Instead, it creates new links, allowing the rhetor to illuminate one term (or concept) by features or senses borrowed from another" (Fahnestock 105). In this case, the coffin metaphor invokes and epitomizes death, and further, relates the decaying of one's intelligence to death.

Keyes' use of the death metaphor, specifically the idea of relating disability to "death," becomes further complicated as Moon explores the relationship between neurodivergent individuals and their struggle with interpreting metaphors. At the beginning of *Flowers,* it was evident that figurative language, specifically metaphors, remained inaccessible to Charlie prior to surgery. Metaphors are often concrete and sensory yet can affect audience's emotions, rendering them a form of pathos and thus, a psychological aspect of rhetoric (Burton). Thus, by constructing the notion that Charlie is unable to understand or interpret metaphors prior to the operation and can only access them post-surgery, Keyes generates the idea that intellectually disabled Charlie does not possess theory of mind. This phenomenon constructs the stereotype that individuals with intellectual disabilities are incapable of possessing theory of mind (this idea will be explored more in-depth in the subsequent section).

Similar to Charlie's initial inability to understand metaphors, throughout *Speed of Dark,* Lou remains self-aware as he, too, struggles to comprehend metaphors that others use. When

Marjory describes Don's rude behavior, she remarks, "'Don can be a real heel,"' to which Lou internally reflects, "Don is not a heel; he is a person. Normal people say things like this, changing the meaning of words without warning, and they understand… If someone is a bad person and you want to say that is a bad person, why not just say it? Why say "heel" or "jerk" or something?" (Moon 30). Lou finds it difficult to interpret the use of metaphors in a variety of situations, especially when he is unfamiliar with the metaphor. With these occurrences, Moon is responding to Keyes' incorporation of Charlie's ability to understand metaphors post-operation. Here, Moon's use of metaphors with Lou reminds the reader that people on the spectrum are different; they cannot all be lumped into a singular category of disability. In an interview with *Publisher's Weekly,* Moon was asked if she was inspired by *Flowers for Algernon* as she wrote *Speed of Dark.* In response, she admits, "I'm sure that *Flowers for Algernon* influenced me in some way" (Moon). Thus, Moon, in response to Keyes, advances the idea that specific rhetorical moves themselves are complicated, yet this does not mean that the neurodivergent fail to understand or use all rhetorical techniques. In fact, throughout *Speed of Dark,* Lou (either knowingly or unknowingly, as he never specifically draws the readers' attention to it) uses a variety of rhetorical moves in conversation or during moments of reflection.

When Lou fences, he experiences a connection with Marjory when they dart around each other and the blades of their swords come together. One afternoon, she asks Lou if he would like to fence, and Lou internally declares, "I do not want to fence. I want to sit with her. I want to touch her. I want to eat dinner with and lie in bed with her" (Moon 308). Although subtly hidden, Lou uses two rhetorical techniques in this short reflection: epistrophe and anaphora. According to Corbett, epistrophe is "the repetition of the same word or group of words at the end of successive clauses" (Corbett 55). The purpose of epistrophe is to set up a pronounced rhythm and

secure a special emphasis, both by repeating the word and by putting the word in a final position of the sentence. Here, the use of epistrophe is particularly fitting in that it is used as Lou and Marjory are rhythmically moving around each other as they fence. Lou's use of epistrophe also serves to underscore his attention to "her," or Marjory in this case. The second rhetorical move Lou uses is anaphora, defined as "the repetition of the same word or group of words at the beginning of successive clauses" (Corbett 54). Like epistrophe, anaphora helps establish a marked rhythm in the sequence of clauses, ultimately producing a pronounced emotional effect. Lou's repetition of "I want" resonates with the reader as he places himself and his desires at the forefront of the sentences. Lou communicates to the reader (and himself) that he knows what he wants and does not want, ultimately removing himself from the stereotype that individuals with autism are unable to express an emotional connection with others. Thus, by employing various rhetorical figures, Moon via Lou illustrates how individuals with autism can possess theory of mind (further evidence of Lou's possession of theory of mind will be discussed in the next chapter).

Although Moon via Lou makes it apparent that Lou struggles with rhetorical techniques such as metaphors, Moon complicates this idea, as Lou uses a variety of other rhetorical techniques (such as epistrophe and anaphora) throughout the novel. In fact, Lou shows his desire to understand rhetorical techniques on multiple occasions. In one instance, Lou wonders, "What would a drop [of water] feel as it slid over a rock, as it fell into nothingness? Water has no mind, water cannot think, but people—normal people— do write about raging rivers and angry floodwaters as if they did not believe in that inability" (Moon 320). Here, Lou wonders about the idea of personification or "investing abstractions for inanimate objects with human qualities or abilities" (Corbett 66). As the novel progresses, it becomes increasingly apparent that Lou's

rhetorical abilities have a pattern. He demonstrates greater trouble with rhetorical figures that substitute and associate. In essence, he can use rhetorical techniques (epistrophe and anaphora) that follow a logical, methodical construction, yet struggles with the abstract and intangible, the hidden meaning of metaphors and strangeness of personifications. Taken together, dissecting the language, diction and respective rhetorical moves provides insight into the disabilities themselves.

The structure, point of view, and rhetorical figures Keyes and Moon employ contribute to readers' understanding of their novels as well as the narrator-protagonists themselves. Keyes' use of progress reports to represent Charlie's story ultimately plays a critical role in maintaining a singular, unified voice of both pre-operative and post-operative Charlie. Similarly, although Moon's use of structure is less extreme, it allows Lou to narrate his story in a linear fashion as he changes throughout before the operation even occurs. The central first-person point of view Keyes and Moon use for Charlie and Lou is one of the most important stylistic choices for the construction of their novels. This narrator-protagonist point of view allows the reader to remain at the forefront of Charlie and Lou's thought processes, feelings, and life experiences. This technique successfully attributes agency and personhood to its neurodivergent narrators. The reader becomes one with the narrator-protagonist, sharing in their journey and exploring the intricacies of their neurodivergent minds. And although the most subtle stylistic technique Keyes and Moon employ is their intentional use of rhetoric, this decision allows the reader to dissect the language used and interpret its meanings. The rhetorical decisions throughout each novel reveal the complexity of each narrator-protagonist as they harness the power of language to tell their own, unique stories.

Confronting Cultural Narratives and Re-Telling the Religious Story

While the structure, language, and rhetoric contribute to the development of the novels and their respective narrator-protagonists, the meaning of each novel is sharpened by their similar integration of cultural narratives and religious stories. Cultural narratives are powerful enablers in connecting the past and present. They are also strong in their ability to reproduce values and worldviews. They appear time and time again across different genres of literature, functioning to tell and retell stories as culture shifts. Cultural narratives are often rooted in a religious context, serving to remind readers of their origin in biblical stories. Often, these cultural and religious stories are found in fiction, especially science fiction, in order to re-analyze the way in which people understand these narratives and address their role in society. In both *Flowers* and *Speed of Dark,* Keyes and Moon draw on different cultural and religious narratives, leaving their narrator-protagonists (as well as other characters) to confront the narrative, re-tell its story, and remake its meaning.

In *Flowers,* Charlie's acceptance of the experimental operation stems from a desire to become "smart," and to use this intelligence to be more similar to those around him. Similarly, this quest for intelligence is mirrored to a greater extent in the peripheral characters of the novel, such as Professor Nemur's insatiable desire to establish himself as a man of great intellect and by extension, scientific accomplishment. In a way, the experimenters are reflections of Charlie. In Charlie's initial progress reports, he expresses enthusiasm about the potential to alter himself via surgical operation in order to increase his intelligence. When Charlie learns he is accepted for the procedure, he writes, "After the operashun Im gonna try to be smart. Im gonna try awful hard" (Keyes 12). Charlie's desire to become intelligent is rooted in the idea that he'll be able to "reed better and spell the werds good and know lots of things and be like other pepul" (Keyes 14).

Charlie's yearning to become "smart" is not rooted in greed or selfishness, but rather, in the idea that he can improve himself and his friendships. He wishes to become like "other pepul" in the hope that he will "find [his] mom and dad and sister and show them" (Keyes 14).

Unlike Charlie's pure intentions in his pursuit of knowledge, Professor Nemur views the acquisition of knowledge as a vehicle for obtaining respect and accolades from his peers, his domineering wife, and the scientific community as a whole. To a great extent, the success of Professor Nemur's research is motivated by external rewards rather than intrinsic value. Desperate to advance his career, Professor Nemur longs for his peers to regard him as brilliant. He remains disinterested in Charlie's human emotions, caring only about Charlie's quantifiable progress as an experimental subject. He cannot stand to feel intellectually inferior to anyone—not Dr. Strauss, and certainly not Charlie. When postoperative Charlie surpasses Nemur's level of intellect, Strauss admits that Charlie "makes [Nemur] feel inferior and he can't take it" (Keyes 133). Nemur embodies a God complex as he takes all credit for "fixing" Charlie, ridding him of the life he had before. Nemur announces at the scientific research conference that, '"It might be said that Charlie Gordon did not really exist before this experiment…."' (Keyes 144). However, when Charlie begins to poke holes in Nemur's research in front of an audience, Nemur becomes uncomfortable, incapable of accepting the idea that he remains ignorant in several sophisticated areas of academia.

Although for vastly different purposes, Charlie and Nemur's desire to seek intellect is reminiscent of the cultural narrative of humankind's overambitious pursuit of knowledge. In the Western tradition, this cautionary narrative dates back to Prometheus, who pursues the knowledge of Zeus' secret of fire and shares it with mankind, only to face consequences when Zeus discovers Prometheus has shared this forbidden skill. The myth tells that Zeus punished

Prometheus as he bound him in chains and sent an eagle to eat at Prometheus' immortal liver every day, which then grew back at night. This cultural narrative hinges on the idea of divine punishment as a consequence of sharing divine knowledge. This narrative has manifested in fictional works as well, from Mary Shelley's *Frankenstein* to Aldous Huxley's *Brave New World.* In his article, "The Quest for Uncertainty: Pragmatism Between Rationalism and Sentimentality," Robert Lake emphasizes some of the dangers in the pursuit of knowledge:

> Anyone engaged in the pursuit of knowledge confronts daunting challenges posed by incommensurable definitions of truth, the destabilising threat of uncertainty, the lure of dogmatism and authoritarianism, and the seductive power of sentimentality. (267)

In *Flowers,* as Nemur pursues knowledge, he develops rigidly dogmatic views concerning Charlie's surgery, eventually deeming himself as a genius within this specific area of research. Similarly, Charlie's pursuit of knowledge presents its own challenges as he eventually possesses the ability to discern right from wrong and is forced to consider ethical dilemmas, such as when he discovers that one of his co-workers at the bakery is stealing money from the business and its customers.

As in Greek mythology, the cultural narrative of the pursuit of knowledge is also present in the Judeo-Christian tradition. Here, the story warns that acquiring knowledge supposedly restricted to God for human good will result in terrible punishment. The religious story haunts *Flowers for Algernon,* namely the appearance and re-appearance of Genesis 3, discussing the fall of humankind after Adam and Eve ate from the tree of knowledge of good and evil. Genesis 3:6 states:

> When the woman saw that the fruit of the tree was good for food and pleasing to the eye, and also desirable for gaining wisdom, she took some and ate it. She also gave some to her husband, who was with her, and he ate it. (Genesis 3:6)

This story appears in *Flowers* as Fanny Birden, a co-worker of Charlie at the bakery, responds when postoperative Charlie asks, "'But what's wrong with a person wanting to be more intelligent, to acquire knowledge, and understand himself and the world?"' (Keyes 96). In response, Fanny counters, "'If you read the Bible, Charlie, you'd know that it's not meant for man to know more than was given to him to know by the Lord in the first place. The fruit of that tree was forbidden to man" (Keyes 97). In essence, Fanny believes that Charlie's decision to undergo the surgery is like Adam and Eve's decision to eat from the tree of knowledge. Eating from the tree and possessing information they were not meant to know, such as the idea of being "naked" in front of one another and by extension, learning about lust and shame, consequently led to their exile from the Garden of Eden. God punished Eve as he asserted, "I will make your pains in childbearing very severe; with painful labor you will give birth to children" (Genesis 3:16) and said to Adam, "Cursed is the ground because of you; through painful toil you will eat from it all the days of your life" (Genesis 3:17). God made both Adam and Eve mortal, promising to return their bodies to the ground in the form of dust. The severity of the punishments stemmed from God's initial warning, which stated, "You must not eat from the tree of knowledge of good and evil, for when you eat from it you will certainly die" (Genesis 2:15). Although Adam and Eve's decision to eat from the tree did not result in immediate death, their eventual death was promised as well as a form of death from the life they knew before.

However, Keyes complicates the idea of the religious re-telling of the fall when Charlie responds, “I’m like a man born blind who has been given a chance to see light. That can’t be sinful… Science can do it, Fanny” (Keyes 97). Here, there exists tension between the religious story and scientific advancements. This tension has existed for centuries, yet Keyes illuminates the idea further in the context of science fiction. Charlie admits that he does not and cannot feel responsible for his choice to undergo the surgery, and that he has not done anything explicitly wrong, unlike Adam and Eve. Fanny continues to whisper, “[Adam and Eve] were driven out of Paradise and the gates were closed to them” (Keyes 97). In some ways, Keyes is commenting on how the surgery (and by extension, scientific advancements on a broader scale) pushes Charlie “out of Paradise” in that his intelligence has driven a wedge between him and the people in his life. If his prior life was Paradise, he has been exiled. However, the novel also problematizes the concept of Paradise and challenges the Biblical story in that way. Charlie’s life prior to the surgery is hardly Paradise, from being mocked by his “friends” at the bakery to struggling to read and write in his night school classes. However, postoperative Charlie also does not experience “Paradise” in that he is fired from the bakery, learns the truth about his “friends,” and is ultimately forced to cope with the psychological impact of realizing his acute cognitive deterioration. A type of parallelism exists when Charlie eventually regresses in his intelligence, and physically exiles himself to the Warren State Home. Thus, after the surgery, Charlie experiences both psychological and physical forms of exile.

The consequences of the pursuit of knowledge in *Flowers for Algernon* are apparent in Charlie’s final progress reports. Unfortunately, he regresses to his initial IQ, if not below that, eventually losing the ability to read and write. When he decides to go to the Warren State Home, he accepts that he must leave his past life and the people in it behind. He writes, “Goodby Miss

Kinnian and dr Strauss and evrybody" (Keyes 274). He no longer remembers that he was close enough to refer to "Miss Kinnian" as "Alice," representing the distance between his current and past self. Further, he completely forgets who the intended audience is for these progress reports, as his last request on the final lines of the report is, "please if you get a chanse put some flowrs on Algernons grave in backyard" (Keyes 274). It is doubtful that the intended audience for the progress reports, the research team, would consider placing flowers by Algernon's grave. This final request further indicates the distance between his past and current self, and the lack of knowledge he retains. Charlie's ultimate "punishment," then, is this gap between his past and present self, a disconnect he is forced to cope with.

Similarly, as the designers of the experiment, Nemur, Strauss, and Burt also suffer from metaphorically "eating" from the tree of knowledge. Their experiment is eventually classified as a failure as Charlie's intelligence regresses, and by extension, they too are viewed as failures. In Charlie's words, "Nemur's fear is being revealed as a man walking on stilts among giants is understandable. Failure at this point would destroy him. He is too old to start all over again" (Keyes 137). The researchers, especially Nemur, fear the idea of being labeled as "failures" across the scientific community, yet this is their punishment for metaphorically "eating" from the tree of knowledge. This type of labeling is a form of exile as well, as it represents a gap created between Charlie's research team and the scientific community. To some degree, the research team experiences psychological exile after their failure with the experiment as well, creating an alienation between them and the larger research community. Although it remains slightly ambiguous if Keyes is truly advocating against one's overambitious pursuit of knowledge, the question is there, as the consequences of the characters' decisions are present. Thus, the alienation from one's former self is similar to God's punishment of Adam and Eve from in that

both must cope with exile. This exile, which takes form both psychologically and physically, manifests itself in the Charlie's progress reports as well as in the biblical story.

In *Speed of Dark,* Moon extends Keyes' engagement with the cultural myth of pursuing knowledge to show how "curing" conditions that make people different involves using knowledge that not everyone thinks people should acquire. In other words, Moon's novel considers whether certain kinds of acquired knowledge should not be used, especially as science continues to advance such as in its ability to "cure" conditions that make people different. One such cultural narrative relating to this idea that Moon's novel grapples with is the idea that people with disabilities lack empathy and thus should be "cured." This cultural narrative is more prevalent in Moon's novel than Keyes', as Lou struggles with the constant narrative that individuals with autism lack empathy. Moon introduces this cultural narrative yet pushes against it, using her narrator-protagonist to illustrate that this idea is not always true for individuals with autism. Lou, constantly bombarded with instances in which his empathy is tested, time after time shows that he does, in fact, empathize with and understand others. Although he does struggle to interpret social nuances in some cases, his ability to empathize with others is never compromised. After his group of autistic friends discuss whether they should take part in the surgery, Lou states, "Now we move without harmony. I can sense the confusion, the anger" (Moon 251). Lou can feel the movements of others and the emotions that accompany such movements. He understands how his friends think and feel about the surgery. He empathizes with their concerns, fears, and everything in-between. Similarly, as he reflects later on whether the surgery is the right choice when he is alone, he admits: "Yet if I lose the memory of what this is like, who I am, then I will have lost everything. I do not want Marjory to be like someone seen on a video screen. I want to keep the feelings that go with the memories" (Moon 267). Thus, for

Lou, one of the major drawbacks of the surgery is the possibility of losing the feelings associated with the memories he has formed. To some extent, he is empathizing with his future self, fearful and distraught when he considers a life without the feelings attached to the memories he has formed. Thus, Moon deconstructs the cultural narrative that people with autism are unable to empathize with others via Lou's reflections, revealing his possession of theory of mind.

In Lisa Zunshine's article, "Theory of Mind and Experimental Representations of Consciousness," she discusses how "Fiction [itself] presents a challenge to people with autism because in many ways it calls for the same kind of mind-reading as is necessary in regular human connection—that is, the inference of mental state form the behavior" (Zunshine 273). However, it is important to note that Zunshine later retracted this statement and apologized, completely changing her view on how individuals with autism can (and do) possess theory of mind. Although Lou does struggle to interpret others' facial expressions and other "mind-reading" abilities, he does exhibit the qualities of theory of mind. Such qualities are seen in his detection and understanding of others' emotions in "regular human connections" and interactions. Thus, Moon's novel challenges the idea that theory of mind remains an area of deficit for people with autism.

As Moon deconstructs the myth that individuals with autism lack empathy, she also engages with Keyes' ideas regarding the consequences of pursuing knowledge through Lou's contemplation of participating in the surgery. Lou internally battles with the idea of altering himself to "cure" his autism, questioning whether he was meant to have access to the knowledge of a neurotypical person. This "cure" promises to transform someone with autism into someone removed from their autism and able to "gain" the qualities that someone with autism lacks, including the ability to understand metaphors, social interactions, and more. Although these are

not specifically a "pursuit of knowledge," they do qualify as a quest for understanding the unknown.

Here, religion and science come into combat once more, and like Keyes, Moon's stance on the issue relating to scientific advancement and religion also remains ambiguous. Lou attends a church service and is surprised that instead of including a reading from Matthew, it offers a reading from John. Lou remarks, "It is the story of the man lying by the pool of Siloam, who wanted healing but had no one to lower him into the pool. Jesus asks him if he really wanted to be healed" (Moon 271). Lou wonders why the idea of being healed would even be a question. Lou's questioning reveals Moon subtly pointing out the irony of Lou's own situation: Why does Lou question being "healed" or "cured" of his autism? It is a complicated question, with no simple answer. Lou even questions, "I wonder what the man would say if he were not paralyzed but autistic. Would he even go to the pool for healing?" (Moon 273). The sermon reminds Lou of the surgery, and he decides that he does need or want to be healed, even if other people (like Mr. Crenshaw) think it is for his own benefit.

Although Lou initially remains steadfast in his belief that he does not need to be "healed" of his autism, his thoughts begin to oscillate, and he considers the idea that God *does* want him to take advantage of scientific advancement and the surgery. Lou questions this, reflecting, "Maybe God thinks I would be better if I weren't autistic. Maybe God wants me to take the treatment… What if God wants me to be something other than I am?" (Moon 275). Lou consults the priest about his questions and is eventually left with even more questions. There is no straightforward conclusion regarding God's belief on "fixing" the disabled and whether it is God's path for someone with autism to remain autistic or to remove it. The priest has no answer for Lou, and by extension, Moon has no clear answer for the reader.

In Lou's conversation with the priest, he learns that although the priest has no answers regarding God's approval or disapproval of treatment, the priest does offer insight into an arguably more important area. The priest tells Lou that above all, "God wants us to be honest, kind, helpful to one another" (Moon 278). Therefore, if the surgery does not interfere with Lou's ability to act kindly toward others, it is not religiously "incorrect" or wrong to pursue the surgery. Interestingly, this idea is further complicated as Lou briefly mentions that the priest himself wears glasses, yet "Most people have surgery when their eyes start to go bad" (Moon 276). If the priest truly believes that it is not morally wrong to undergo a "healing" or "curative" process, why does *he* choose not to? Thus, Moon leaves the reader with this question, extending on Keyes' idea of pursuing the "forbidden fruit" of knowledge and utilizing such knowledge to cure oneself.

However, Moon complicates Keyes' cultural narrative of the pursuit in that in the ending of *Speed of Dark,* Lou's surgery is a success, and he fulfills his lifelong dream to become an astronaut. However, the surgery is not without its consequences. Lou admits, "I know the Lou-before loved Marjory, but nothing happened inside when I looked at her afterward" (Moon 340). Although Lou makes new friends, pursues a new career, and becomes successful in many aspects of his "new" life, it is not without its drawbacks. He loses his love for Marjory and some of his most beloved friends from the fencing group. If interpreted against the Garden of Eden story, to an extent, there is a loss of innocence for Lou. When Adam and Eve's see themselves and their world (and their nakedness) through new eyes after eating from the fruit of knowledge, nothing is the same again. Similarly, after the surgery, Lou's life takes on different meaning. The novel's ending concludes with Lou leaving Earth (and the people in it) behind as he travels to space. In the end, Lou (like Charlie) experiences a form of self-exile as he distances himself from the life

he knew before. Ultimately, Moon, like Keyes, illustrates how one's pursuit of knowledge creates a gap between their current and past self, and this constructed gap is its own form of punishment when one pursues knowledge one should not have.

Ultimately, both Keyes and Moon use cultural narratives to advance their stories, leaving readers to meditate on the impact of these narratives in the realm of science fiction. The cultural narratives, including the overambitious pursuit of knowledge and the idea that people with autism lack empathy, become complicated. However, it is unclear whether these narratives are truly challenged in *Flowers* and *Speed of Dark* or whether the authors merely introduce them to provide a basis for connecting the ways in which retellings of religious stories and cultural narratives exist in tandem with one another.

In Terrence Cave's book, *Thinking with Literature: Toward Cognitive Criticism,* he reflects on some of the ways in which narratives can exist within literature and the purpose of literature:

> You can write its history, you can analyze its formal properties or traditions, you can construct theories of literature and of literary criticism, you can treat it philosophically as an aspect of aesthetics or ethics. In the broadest sense of the word, 'literature' can become an object of anthropological and cognitive study, a human phenomenon operating within the constraints of human phylogenetic and cultural evolution. (139)

To some extent, Cave is reflecting on the purpose of literature as an artifact for the study of the human. Similarly, the purpose of literature (as stated above) can be applied to the construction and continued use of cultural narratives in literature. As Cave states, the ability to "analyze its formal properties or traditions" can also be afforded when encountering cultural narratives in literature. The purpose of cultural narratives, then, is to consider how these narratives function in

different kinds of literature and their role in advancing the ideas and themes of the literature itself. Cultural narratives become particularly interesting in the genre of science fiction as they take on new meanings, and in this case show how the protagonists (Charlie and Lou) cope with the role of science as it confronts cultural narratives, such as the pursuit of knowledge or the idea that individuals with autism do not possess the ability to empathize with others. There will always exist tension between science, religion, and culture. Yet this tension gives rise to different and complex ways of understanding how these areas intersect.

In their novels, Moon and Keyes grapple with the ambiguity of the tension between religion and scientific advancement. In *Flowers,* Charlie undergoes the surgery yet eventually experiences immense regression in his intelligence and is left in a cognitively worse position than his original self. In *Speed of Dark,* Lou undergoes the surgery yet fulfills his lifelong dream to become an astronaut but loses some of his most meaningful personal connections. Thus, the authors' novels do not take clear positions on these cultural myths. However, the point remains that both authors introduce new ways of interpreting these cultural narratives and religious stories within the context of neurodiversity and scientific technological advancement. The stories of science fiction create significant potential to challenge, question, and encourage readers to rethink cultural myths based on the scenarios they create. And reciprocally, they re-evaluate the meanings, values, and judgements they attach to neurodiversity.

Chapter Two: Stereotypes, Relationships, and Technology as a "Cure"

Constructing and Deconstructing Stereotypes

Together, the stylistic and structural choices as well as a re-evaluation of the cultural and biblical narratives in the previous chapter help create a foreground for outlining some of the most prominent stereotypes confronted in *Flowers* and *Speed of Dark.* Throughout both novels, the protagonists face many, dehumanizing moments, many of which occur in the context of the stereotype that people with disabilities are unproductive members of society. Further, both novels challenge and deconstruct the stereotype that people with disabilities are incapable of living fulfilling lives. As the novels' plotlines parallel one another, they explore common themes of the direct and indirect implications of choosing to use a form of experimental surgery to "cure" their disabilities. Throughout both novels, the protagonists face numerous instances in which they are stereotyped, either from individuals in the workplace, relationships with others, or from the scientific researchers themselves. These instances, witnessed through various social interactions throughout, allow the reader to think more deeply about the past (and current) depictions of neurodivergent individuals in these science fiction novels (and society). These novels successfully explore the ways in which science fiction as a genre can either construct or deconstruct such stereotypes as well as reconstruct and re-evaluate what it means to be "normal" in society.

In *Flowers for Algernon*, the reader learns early on that the proposed neurological operation is quite experimental and unproven. As Charlie reports in his journal, Algernon is a "speshul mouse the 1st animal to stay smart so long after the operashun" and that "Dr Strauss says that so far Algernon looks like he mite be smart permanint and he says that's good sine because we both had the same kind of operashun" (Keyes 16). Here, the reader learns that not

only has the experimental operation only been successful with non-human subjects, but also that its success has only been permanent with a singular subject. This fact, however, does not hinder Dr. Strauss and Professor Nemur from pursuing the surgery with Charlie, and similarly, does not discourage Miss Kinnian from encouraging Charlie to participate in the operation. In fact, the primary reason Charlie is selected for the surgery is that "Most people of his low mental ability are hostile and uncooperative. They are usually dull and apathetic and hard to reach" (Keyes 8). Thus, Charlie is chosen for the experimental procedure because he is perceived as ambitious and hardworking, two characteristics that Professor Nemur believes most individuals with intellectual disability lack. This moment is telling in that it reveals how the neurotypical characters in the story believe the stereotype that people with disabilities are unproductive. Professor Nemur, among other characters in the novel, perpetuates the false stereotype that individuals with cognitive disabilities are merely lazy and difficult to motivate. To the researchers, Charlie's enthusiasm to learn and actively take part in the operation is presented as unusual for someone with a disability, thus making him an "overcomer" figure to Professor Nemur, and an adequate participant for the operation.

Throughout the novel, Charlie continues to face dehumanizing stereotypes both prior to the surgery and post operation. Prior to the surgery, Charlie's co-workers continuously mock him, and Charlie remarks that, "Some times somebody will say hey lookit Frank, or Joe or een Gimpy. He really pulled a Charlie Gordon that time" (17). It is evident to the reader that "pulling a Charlie Gordon" is a euphemism for characterizing Charlie's behavior as abnormal, lazy, or lacking common sense. The derogatory rhetoric Charlie's co-workers use is further compounded by the fact that Charlie is unable to understand the meaning behind the words or recognize that it is a joke directed at his own behavior. He admits that he "does not know why they say it but they

always laff and [he] laffs too" (17). It is apparent that Charlie's co-workers view Charlie as a form of entertainment, finding extra pleasure in the fact that Charlie does not understand that the jokes are directed at him. The novel plays into stereotypes that victimize Charlie, leaving the reader to express pity for the individual with the disability. In many ways, the novel makes it seem as though the "childlike" and "innocent" Charlie is unable to understand or feel the abuse that his co-workers heap upon him, suggesting that individuals with intellectual disabilities are socially unaware to the point that they are incapable of feeling the pain of mockery. In Sonya Loftis' *Imagining Autism,* she argues that this type of "pity-inducing trope of infantilizing the mentally disabled" (Loftis 72) ultimately serves as a stereotype that removes Charlie's subjectivity and further dehumanizes him. The pity-inducing trope conjures the idea that Charlie's existence is solely defined by his disability and that his social interactions with others hinge on this form of mockery.

In *Speed of Dark,* Lou Arrendale confronts the same stereotype in that people with autism (in this case) are unproductive members of society. Throughout the novel, Lou receives much criticism from his manager at work, Mr. Gene Crenshaw. From the initial interaction between Lou and Mr. Crenshaw, readers learn that Mr. Crenshaw shows an immense dislike for Lou solely due to his autism, thus highlighting how neurotypical individuals view people solely based on their disability. Mr. Crenshaw argues that the company suffers "at an enormous expense" as it provides the workers who have autism (referred to as "Section A" within the company) with "their own private gym, sound system, parking lot, all kinds of toys" (Moon 14). The irony strengthens as the novel later reveals that the upper management also has its own private gym, sound system, parking lot, and such useful "toys" as stock options. However, despite the fact that Section A has the most productive figures out of all the departments at the company, Mr.

Crenshaw remains steadfast in his belief that "The company is going places, and it needs a workforce of unimpaired, productive workers— people who don't need all these little extras" (Moon 14). Mr. Crenshaw views autism as an inconvenience, a barrier to productivity and a waste of resources. Just as in *Flowers,* Mr. Crenshaw, like Nemur, attributes laziness to disability and perpetuates the stereotype that people with disabilities need assistance to feel motivated. Mr. Crenshaw complains that "If [Section A] was normal, they wouldn't have an excuse for those luxuries" (Moon 16). Although Mr. Crenshaw views autism as an inconvenience, he fails to recognize that without their autism, the company would suffer as it would lack the resources and abilities necessary to decode and create the complex algorithms for which Section A is responsible. As Mr. Crenshaw purports that "Autistics don't know the first thing about how society works" especially not the way that a "normal person" does (Moon 13), the irony is further reinforced as Mr. Crenshaw is eventually fired due to unethical behavior and failing to understand the ethics that guide society's (and the workforce's) established laws. In this instance, the idea of normalcy arrives, and with it, the conversation regarding the potential to "cure" the employees of their autism with an experimental surgery, transforming them into "normal" employees.

As Mr. Crenshaw complains about the "luxuries" needed for Section A to remain productive, he suggests that the employees take part in an experimental operation that (as in *Flowers*) has not yet been tested with humans. When asked what the "treatment" entails, Mr. Crenshaw remarks, "'Oh, some combination of neuro-enhancers and nanotech. It makes the right parts of the brain grow, supposedly'" (Moon 16). Although the novel takes place in the future, it is highly unlikely that this, or any, experimental treatment would "grow" parts of the brain. Mr. Crenshaw's demand for Section A to receive the surgery highlights the stereotype that

individuals with autism have the "wrong parts" of their brain overgrown and that they are missing the "right parts" of their brain. As in *Flowers,* the science is presented as ridiculously illogical, almost comical. Thus, Moon uses Mr. Crenshaw as a character, highly biased against individuals with autism, to underscore some of the dehumanizing stereotypes that exist targeted toward individuals with autism within the context of science fiction, but also to highlight the absurdity that exists when solely attempting to use the medical model to assess and understand disability.

Together, *Flowers* and *Speed of Dark* also confront the stereotype that people with disabilities are incapable of living fulfilling lives. In *Flowers,* Nemur reveals how he (and other members of society) viewed Charlie prior to the surgery. At the research conference, Nemur presents the operation's work claiming,

> When Charlie came to us, he was outside of society, alone in a great city without friends or relatives to care about him, without the mental equipment to live a normal life. No past, no contact with the present, no hope for the future. It might be said that Charlie Gordon did not really exist before this experiment. (Keyes 143-144)

Nemur, like other neurotypical characters in the novel, perpetuates the idea that intellectually disabled Charlie did not lead a fulfilling life (or a life, at all). Although Keyes uses narcissistic neurotypical characters such as Nemur to confront this stereotype, he successfully deconstructs this idea through Charlie's progress reports. Within the reports, Charlie reveals his resentment of this stereotype:

> It may sound like ingratitude, but that is one of the things that I resent here—the attitude that I am a guinea pig. Nemur's constant references to having *made me what I am,* or that someday there will be others like me who *will become real human beings.* How can I

> make him understand that he did not create me? […] He doesn't realize that I was a person before I came here. (Keyes 129-130)

Charlie lived a fulfilling life before the surgery. He was passionate about his work at the bakery and the friendships he had, and above all, found great pleasure in his daily routine and autonomous lifestyle. Nemur, from a neurotypical perspective, fails to understand how anyone could live a "fulfilling" life if they are not viewed as intellectually savvy, leading groundbreaking research, or living a "normal" life free of disability. Here, Keyes' implication is clear: It is only neurotypical people who fail to view the neurodivergent experience as unfulfilling, a belief that ultimately highlights neurotypical people's failure to imagine a different reality and their discomfort when "normal" does not resemble their own existence. Similarly, in *The Autistic Brain: Thinking Across the Spectrum,* autistic author and scientist Temple Grandin argues:

> We've come a long way from the days of doctors telling the parents of autistic children that the situation was hopeless and that the only humane option was a life sentence in an institution. We have a lot farther to go, of course. Ignorance and misunderstanding are always difficult to overcome when they've become part of a society's belief system. (203)

In her book, Grandin, an autism rights activist, breaks down different stereotypes attached to disability. These stereotypes are similar to the ones Charlie confronts throughout *Flowers*. To Nemur, Charlie's life prior to the surgery was empty and unfulfilling. However, this ignorant attitude (as Grandin argues) is one that has "become part of society's belief system" and must be challenged in order to create new ways of thinking about disability and to re-evaluate the meaning of "normal" in society.

Moon takes the idea of normalcy introduced in *Flowers* a step further as she invites readers to *reevaluate* normalcy and its relationship to autism. Another interaction between Lou and Mr. Crenshaw reveals this phenomenon. After Lou watches how Mr. Crenshaw ridicules and verbally abuses his direct supervisor, Pete Aldrin, Lou wonders, "Are normal people afraid of other people like that? And if so, what is the benefit of being normal?" (116). Here, Moon via Lou reevaluates the meaning of normalcy, challenging the idea that being "normal" is without struggle or emotionally charged instances. In Katherine Allan's *Disability in Science Fiction,* she writes, "One of the major drawbacks to being autistic in this world is the fear of being misunderstood, disliked, or mistreated, but if non-autistic people also feel that fear, then, normalcy may not actually be that much better than autism after all" (Allan 162). Allan helps narrow the gap between neurotypical and neurodiverse individuals, emphasizing that both individuals experience the same fear of being misunderstood or socially punished. Humans fear the same phenomenon, disability or not. Thus, Moon helps remove the idea of the "pedestal" that seems to belong solely to neurotypical individuals, highlighting the common experiences both neurotypical and neurodivergent people share. Here, she emphasizes that both experiences matter and that one must not be valued over the other. Throughout *Speed of Dark,* Moon successfully bridges the gap that exists between the experiences of neurotypical and neurodivergent communities, while also emphasizing the importance in acknowledging some of the unique differences that both groups bring when understanding lived experiences.

The conversation about lived experiences exists in parallel with the idea of normalcy, which appears throughout the novel as readers are privy to experiencing and understanding Lou's world through his thought processes. Unlike in Charlie's initial progress reports in *Flowers,* readers are invited to experience Lou's life prior to the surgery. In *Flowers,* readers

receive limited exposure to Charlie's inner thought-processes, feelings, and understandings of the world he experiences. Charlie's preliminary exams for the surgery reveal that he struggles with the Rorschach test, a psychological test in which subjects' perceptions of inkblots are recorded and analyzed for interpretation. However, it becomes clear that tests such as these are insufficient to measure someone's intelligence or to understand the way in which they understand the world. During the test Charlie remarks, "I tolld Burt I saw ink spilld on a wite card. Burt said yes and he smild and that maid me feel good. He kep terning all the cards and I tolld him somebody spilld ink on all of them red and black [but] I couldn't see no picturs in the ink" (Keyes 4). Although Charlie cannot visually interpret the hidden pictures within the inkblots, the test reveals the absurdity of testing neurodivergent individuals with experiments designed by neurotypical people. Through this demonstration, Keyes introduces the idea that imposing neurotypical ways of interpreting the world is insufficient for understanding neurodivergent experience. Moon takes this idea one step further as she invites readers to understand how neurodivergent people experience the world.

When Lou arrives at work, he describes the objects and surroundings to which he pays close attention, such as the number of cars in the parking lot. "I remember things like what percentage of cars in the parking lot are blue because I pay attention to color and number more than most people. They don't notice, so they don't care" (Moon 222). His description of the percentage of cars in sight challenges the idea that the differences between his perceptions and "normal" perceptions are deficits. Then, he questions, "I wonder what they do notice when they look at a parking lot. What else is there to see besides the rows of vehicles?... What do I miss, as they miss seeing the beautiful numeric relationships?" (Moon 222). Lou views the world through a series of intricate patterns, analyzing his surroundings in a uniquely fascinating way, from the

spontaneous pattern of bubbles boiling in his soup to the connections of numbers he studies at work. He finds joy in these patterns, and through his vivid descriptions, elicits the same kind of joy for readers. Though Lou is often perceived as flat because of his non-normative behaviors, the novel's portrayal of his neurodivergent sensory relation to the world actually becomes a way for Moon to gesture to his uniquely complex interiority.

One of the most prominent examples of this complex interiority is Lou's pattern recognition abilities and his incredible knack for fencing as he analyzes the patterns of others' footwork to perform a series of defensive moves and counterattacks. Although at first it seems that Moon uses the autistic savant-like stereotype when describing Lou's penchant for data and pattern analysis, her careful construction of Lou's thought processes deconstructs this stereotype. Lou's pattern analysis skills are reflected in his ability to use music to "analyze the complex patterns mirroring the pattern [he] needs," when working as a bioinformatics specialist. Perhaps most impressive is Lou's ability to connect music to data to nature, an intriguing combination that forces all neurotypical readers to consider the unique mind of the neurodivergent. Lou ponders: "I let the place in my mind that finds and generates patterns sink into the project, and then it is like ice crystals that grow on the surface of still water….one after another, the lines of ice grow, branch, branch again, interlace" (Moon 6). Moon via Lou reconstructs this stereotype, pulling the readers into Lou's mind and thrusting them into a space in which data becomes a fractal of ice crystal. Lou's thought processes are meant to confuse the readers, to draw them into a space in which they can reconsider the existing stereotypes that prevail with the "autistic savant."

The stereotype is further challenged when Lou begins to wonder about life without patterns, a "neurotypical life." Consequently, a form of darkness and emptiness consumes him as

he considers life without the comfort of such subtle patterns that weave their way into his everyday life. To an extent, this echoes how many neurotypical people inaccurately construct ideas of autism and nerodivergence as forms of "emptiness." Lou remarks: "I think of my time in the office when for a few moments the meaning of the symbols, the beautiful intricacy of the patterns of data, went away and left me confused and distracted" (Moon 136). For Lou, what is life without the beauty of the patterns intricately woven into the everyday? What does a "normal" life mean if it is void of the aspect of living he treasures most? And perhaps most importantly, is Lou still Lou without his innate pattern recognition abilities, without his autism? Throughout the novel, these intricate and unique examples of pattern recognition and analysis ultimately allow the reader to understand the way in which Lou understands the world. In fact, by engaging and reconstructing with this pattern-analysis stereotype, Moon makes it difficult for the reader *not* to wonder how life might be understood and interpreted if he or she were neurodivergent. This thinking reframes the way in which neurotypical readers engage with the text, prompting them to consider what else could be learned if the time was taken to truly divulge the lived experiences of neurodivergent individuals.

Together, in *Flowers* and *Speed of Dark,* Keyes and Moon confront existing stereotypes about neurodivergent people. Both authors confront the notion that people with disabilities are unproductive members of society, thus considering how the economic forces of society affect representations of disabilities. The authors also confront the neurotypically constructed stereotype that neurodivergent people are incapable of leading fulfilling lives. And further, both authors re-evaluate the idea of what it means for someone to be normal. While Keyes merely introduces the idea, Moon directly responds to it and expands on it, using Lou's ways of thinking and interpreting the world as evidence that "normal" has no tangible existence. Taken together,

the novels introduce stereotypes, constructed by neurotypical individuals, that continue to manifest themselves in society today and ultimately work to deconstruct them and re-evaluate the idea of normalcy.

On the Representation of Neurodivergent and Neurotypical Relationships

Similar to the ways in which Keyes and Moon construct and deconstruct stereotypes in the novels, they also explore and redefine representations of relationships between the neurodivergent and neurotypical characters. Exploring the relationships between the characters reveals how the idea of disability is constructed by neurotypical people's inability to imagine another way of being, thus highlighting their own "lack." The relationships also reveal how the idea of normality is afforded to neurotypical individuals up until the point where they display dangerous, harmful behavior. Yet, this is not the case for neurodivergent individuals. In *Flowers* and *Speed of Dark,* there exists a similar archetype of characters who are unable to accept the protagonists with their disability and vehemently express disapproval of their existence. In fact, both novels utilize characters who are so steadfast in their belief that any disability or deviation from that of a neurotypical person is wrong or immoral that these characters equate neurodivergence with death.

In *Flowers,* threats of filicide haunt the novel as Charlie's mother screams, "He's better off dead. He'll never be able to live a normal life" (Keyes 184). Again, the idea of being "normal" arises and Charlie fails to understand the gravity or meaning of his mother's words. Although Charlie's mother is a complex character, it becomes clear that her motivation for forcing him to become neurotypical by any means necessary is driven by her own insecurity about experiencing ridicule from others. This filicide further manifests itself as Charlie's mother

threatens him with a knife and he "vaguely sensed that she wanted to hurt him" (Keyes 184-185). Here, Charlie's mother pushes the idea that possessing an intellectual disability or being differently abled is unacceptable and that one cannot live a fulfilling life if one is not neurotypical. This harmful stereotype also manifests itself *Speed of Dark* as Lou's alleged friend from fencing practice becomes unhinged and attacks Lou.

During the attack, Don corners Lou in a parking lot that he knows Lou visits every Thursday and screams, "You're a *freak,* Lou—you understand what I'm saying? You're a freak and you belong in a zoo" (Moon 212). Don, envious that Marjory (Lou and Don's shared love interest) enjoys Lou's company, lashes out. Don's hatred for Lou stems from a place of insecurity, jealousy, and resentment, as Lou remains well-liked by the fencing team after Don is asked to leave for his upsetting and rude behavior toward Lou. In the end, it is Lou's pattern recognition that saves his life, as he acknowledges that "His pattern is simple, easy to recognize… My hand catches his wrist as it moves forward, parries it to the side" (Moon 212). This theme of violence from anger directed toward the neurodivergent individual, or the disability itself, underscores the ultimate lack of understanding and fragmented relationship between the neurotypical and neurodivergent characters in each novel. Both Keyes and Moon encourage readers to re-evaluate normalcy by creating villainous characters who appear outwardly normal. Don, who is perhaps not entirely stable, is afforded all the rights and privileges accorded to normalcy until he attacks Lou in the lot. Similarly, Charlie's mother (Rose Gordon) is also afforded all the rights and privileges of normalcy until she attempts to kill her own son in the kitchen. It is only with these extreme behaviors (Don attacking Lou and Rose threatening Charlie) that the reader dissociates normalcy from these villainous characters. As Allan argues in *Disability in Science Fiction*, "this association between villainy and normalcy is

striking; there are differences of opinion and personality within the disabled community, but there are no villains there" (Allan 163). Using these character dynamics, Keyes and Moon question the meaning of "normal," and the privileges afforded to "normal" people.

In the same vein, both authors use these villainous characters to develop instances in which their protagonists are labeled as sexual transgressors and use these instances to overcome existing stereotypes, challenging the idea of normalcy. This idea is historically rooted in the reality that in the United States, there have been long-standing cultural fears that cognitively challenged people are hypersexual and need to be sterilized or controlled. When Rose Gordon reaches for the knife to threaten Charlie when he is in the presence of her sister, she screams, "What are you doing to her? Get away from her! I told you what I'd do to you if I ever caught you touching your sister again! Dirty mind! You don't belong with normal people!" (Keyes 191). The fear of disabled sexuality is present as Charlie is labeled as a sexual threat while simultaneously existing as the potential victim of filicide. Several times throughout the novel, Charlie remembers that his mother is afraid that he will sexually assault his neurotypical sister, Norma, despite the fact that he never remembers making any verbal suggestions or behavioral actions that would suggest this. However, even after the surgical operation, Charlie doubts himself, "fearing that the cultural stigma regarding disabled sexuality could be true" (Loftis 73). Rose Gordon continues to dehumanize Charlie and his sexuality and promises that "if [he] ever touches a girl, [she'll] put [him] away in a cage, like an animal, for the rest of [his] life" (Keyes 192). Post-operative Charlie wonders if he ever behaved in a way that would elicit and justify his mother's words. He questions the potential of the "horrible thoughts repressed behind the barriers of his tortured conscience" (Keyes 195). At the end of the interaction with his mother, despite her remarks, he chooses to empathize with her position and forgive her. With this

decision, the novel seems to authorize the idea as even post-operative Charlie views the intellectually disabled version of himself as a potential sexual threat. Post-operative Charlie doubts his previous self as he chooses to forgive his mother for her attempted attack. On the surface, Keyes seems to be buying into the dehumanizing stereotype that individuals with disabilities are sexually dangerous. However, perhaps, in this disheartening moment, Keyes is highlighting the power of influence that the neurotypical asserts over the neurodivergent. Keyes uses both pre-operative and post-operative Charlie to engage with this influence of power. Through this instance with Charlie's mother, Keyes shows the level of influence that such stigma carries in both the neurotypical and neurodivergent communities. Even the new, "normal" Charlie accepts the idea that he might have behaved in a sexually inappropriate way despite never recalling such instances. Although Keyes does not truly deconstruct this stereotype in *Flowers,* Moon's engagement with the same stereotype through the interactions between her characters does.

During Don's attack in the parking lot in *The Speed of Dark,* he shouts at Lou, '"Your kind doesn't need normal women. Freaks should mate with freaks, if they have to mate at all. The very thought of you taking—being that way—with a normal woman just makes me puke. It's disgusting"' (Moon 212). Again, Don compares Lou's "kind" to less than human, perhaps even less than an animal in this case, as he suggests that people with autism may not have to "mate at all." In this moment, Lou does not express anger or fear; instead, he admits "what [he] feels is not fear but sadness, sadness so great it is like a heavy weight all of [him], dark and formless" (Moon 211). He explains that this sadness stems from the fact that he considered Don a friend, up until this moment and despite past demeaning comments Don directed at him. Even more significantly, as Lou watches the policemen arrest Don, who is "crying with tears running

down his face," Lou says, "I am sorry. It would feel very bad to be crying in front of people like that" (Moon 213). In this moment of reflection, Moon via Lou overcomes the stereotype that individuals with autism lack empathy. However, not only does Moon subtly yet successfully show Lou's empathy, but she also uses this emotionally charged event to return to the conversation of normalcy.

In Jeanette Kennett's study, *Autism, Empathy and Moral Agency,* she argues that "Many discussions of psychopathy in both the philosophical and psychological literature see lack of empathy as the critical defect which is at the root of the psychopath's amoralism" (Kennett 341). Moon attributes psychopathic behaviors and tendencies to Don, returning to his lack of empathy numerous times throughout the novel. With this attack, Moon confirms Don's psychopathic behavior and places Lou in a position where he must respond to such behavior. Through this circumstance, Moon helps overcome the stereotype that "Lack of empathy is claimed to be a critical impairment in autism" (Kennett 341). Here, Lou places himself in Don's position, imagining the discomfort and anxiety Don must feel as the policemen arrest him. Through this cognitive positioning, Lou shows his possession of theory of mind, another cognitive state that people with autism have been thought to be unable to experience. With this instance in the novel, Moon overcomes these stereotypes and further complicates the idea of normalcy and the attributes that construct our current understanding of the meaning of being a "normal, functioning member" of society today.

Although these villainized characters exist in *Flowers* and *Speed of Dark,* both novels also engage with the exploration of romantic relationships between the neurotypical and neurodivergent characters. In *Flowers,* Charlie develops an emotional attachment to his schoolteacher, Alice Kinnian, and expresses his admiration for her throughout. It is important to

note that pre-operative Charlie does not express an emotional connection to "Ms. Kinnian" and only seems capable of transforming his friendship with her into something more in his post-operative state. Again, this constructs the stereotype that neurodivergent individuals "lack the capacity" for developing complex, romantic emotions for other people. Similarly, only post-operative Charlie develops a sexual relationship with Fay, his next-door neighbor who exhibits the spontaneous, rambunctious nature he craves once he becomes the hyper-intelligent yet stoic post-operative Charlie. Pre-operative Charlie had little to no understanding of sexual interactions, further constructing the stereotype that neurodivergent individuals struggle with developing sexual connections.

However, a strange conundrum exists when the guarded, post-operative Charlie who supposedly embodies a hyper-intelligent neurotypical is stunted in his emotional capacity to engage with Alice and Fay. Alice believes Charlie is "different," saying, "You've changed. And I'm not talking about your IQ. It's your attitude toward people — you're not the same kind of human being… I mean it. There was something in you before… a warmth, an openness, a kindness that made everyone like you" (Keyes 122). In some ways, Charlie has become emotionally stunted by the operation, failing to connect with people despite his ability to now "feel" the romantic emotions of which he was apparently deprived of or "starved for" before (Keyes 148). Here, the novel plays into yet another social stereotype that highly intelligent people are emotional basket-cases. With the complicated romance between Charlie and Alice, and the sexual yet exciting relationship with Fay, Keyes highlights the complex dimensions of neurodivergent to neurotypical relationships, simultaneously constructing and deconstructing stereotypes surrounding these relationships. Within the intricacies of this relationship, there exists a tension between happiness and intelligence.

As Charlie becomes increasingly intelligent, becoming fluent in languages within a matter of weeks and performing highly in mathematics, physics, neuroscience, etc., he becomes less happy as he realizes the "truth" of his relationships. He realizes his co-workers are perhaps not his friends at all as he reaches the understanding that their relationship has always been built on mockery. Further, he realizes his new, "neurotypical" self is not enough for Alice as the "warmth," she mentions was perhaps his past blind acceptance of the mockery he received from others. Thus, although his newfound intelligence brings truth, it fails to bring him the social acceptance he craves and the love he ultimately seeks, thus underscoring the idea that his new "neurotypical" self is not the key to reaching the true form of "intelligence" he initially seeks before the operation. In fact, despite the joy he finds in learning myriad subjects and complex topics, no topic or academic area brings him true happiness.

Similarly, in *Speed of Dark,* Moon uses Marjory, another member of the fencing team, to depict the intricacies between the neurotypical and neurodivergent relationship. However, unlike Keyes, Moon does not further construct the stereotype that individuals with autism are unable to have the capacity to develop a romantic connection to someone. Although Moon does highlight instances in which Lou struggles to interact with Marjory and ask her out to dinner, she also highlights Lou's ability to change without an experimental operation. During moments of reflection, Lou recognizes: "I am changing already. A few months ago, I did not know that I loved Marjory. I did not know I could fence in a tournament with strangers. I did not know I could learn biology and chemistry the way I have been. I did not know I could change this much" (Moon 176). Here, Moon responds to Keyes as the protagonists in each novel respectively exhibit a similar transformation in their ability to increase their knowledge, yet Moon shows that an operation is not necessary for a neurodivergent individual to evolve. Moon further deviates

from Keyes in that the romantic relationship constructed between Marjory and Lou is not emotionally stunted, but rather continuously evolving and understanding.

The conversations between Lou and Marjory initially mirror those between Charlie and Alice yet deviate when the topic of "normal" emerges. When Lou announces to his fencing mates, including Marjory, that he will undergo an experimental operation to "cure" his autism and make him "normal," Marjory immediately expresses her disapproval. She interjects: "Normal! But Lou, you are fine the way you are. I *like* the way you are. You don't have to be like everyone else. Who has been telling you that?" (Moon 304). Although in this moment Lou is certainly thinking about individuals such as Mr. Crenshaw and Don, who have expressed criticism of Lou's autism, Moon via Marjory seems to be responding to Alice's idea of what defines someone as "normal" in *Flowers.* When Alice and Charlie have the initial conversation regarding his potential to take part in an experimental surgery, Alice convinces Charlie that this surgery will make him "normal," and Charlie expresses enthusiasm about the idea of "getting smart" (Keyes 3). The novels diverge in these conversations as Marjory attempts to convince Lou to forgo the surgery, while Alice attempts to persuade Charlie to change.

While both Charlie and Lou decide to participate in their respective operations, their reasonings are motivated by different desires. Charlie's reasoning was largely rooted in his desire to become "smart" as well as Ms. Kinnian's encouragement to become "normal." This initial decision serves as the starting point for the novel. Thus, it is appropriate to dissect the end of Moon's novel, in which Lou's decision to participate in a similar, experimental surgery is made in the final chapters for an entirely different reason. Unlike Charlie's, Lou's desire for the surgery does not stem from the desire to increase his level of intelligence or from the coercion of others. Rather, Lou's choice stems from his desire to be autonomous because he "does not like

being the one who always needs help" (Moon 304) as well as his desire to explore the unknown. Lou says, "it's about me" and no one else. Lou wants to "go places and learn things [he] did not know before," and experience a new way of viewing the world in which he lives. Moon via Lou creates a tension between happiness and the unknown: Will Lou be happy post-surgery? This simple question raises complex issues for Lou to consider. As these questions unravel, it becomes clear that Lou's motivation for volunteering in the surgery does not stem from his rejection of autism or a belief that he is less-than, but rather, because he wishes to understand and interpret the world in a different way.

In Lou's final words, it is evident that he is satisfied with his decision to have undergone the surgery, even though the "Lou-before loved Marjory, but nothing happened inside when [he] looked at her afterward" (Moon 340). Again, this is different, nearly the opposite in fact, of Charlie's relationship with Alice. Unlike Charlie, who was only able to experience romantic feelings toward Alice after the surgery, Lou feels nothing for Marjory once he is "cured" of his autism. Here, Moon deconstructs the idea that neurodivergent individuals can not feel or express emotions in the way that neurotypical people do. Yet, the novel goes further in that it brings to the surface the idea that neurodivergent individuals possess self-awareness and can make decisions regarding risk, reward, and relationships with others. In the final pages, Lou reflects: "I chose to go on, to risk success, to find new friends, to be who I am now" (Moon 340). In essence, Lou chose the surgery to experience a "neurotypical" life, not because it would be better or worse, but rather, because it would be different. Here, Moon finally levels the playing field between neurotypical and neurodivergent as "the speed of light and dark will be the same" (Moon 321). When Lou decides to undergo the surgery, Moon relieves the tension between

happiness and the unknown, ultimately leaving readers to understand that to embrace difference, whether neurotypical or neurodivergent, is to embrace new, uniquely complex experiences.

Together, Keyes and Moon explore friendships, family dynamics, and romantic connections in their novels to highlight how representations of such relationships either construct or deconstruct stereotypes about neurodivergent people. Although Keyes introduces relationships that serve to enforce existing ideas of normalcy and the ways in which people with disabilities engage in such intimacy, Moon disarms this idea. Moon uses relationships between Lou and other characters to underscore how neurodivergent individuals can successfully develop friendships and romantic feelings for others. Moon also introduces the idea that neurodivergent individuals possess self-awareness and can make decisions regarding risk and reward within the context of their relationships with others. Both authors introduce a similar thematic plotline of using technology as a "cure" for disability, ultimately highlighting how curing disability to become neurotypical neither advances one's social capabilities nor allows one to experience a "normal" life. Thus, both authors successfully explore fallacies of normalcy through the protagonists' relationships with neurotypical characters in the novels.

Chapter Three: Neuroethics in *Flowers for Algernon* and *Speed of Dark*

Introduction to Neuroethics

Neuroethics, a recently emerged field at the intersection of bioethics and neuroscience, seeks to explore the ethical, legal, and social implications of neuroscience research. The field of neuroethics can be classified into two categories: the ethics of neuroscience and the neuroscience of ethics. The ethics of neuroscience comprises the bulk of work in neuroethics as it focuses on the impact of neuroscience research and its consequent ethical dilemmas. This branch of neuroethics studies the implications of neuroscience for human self-understanding, morality, and identity. The neuroscience of ethics concerns the way in which the brain understands and interprets ethical questions, issues, and decision-making choices. Although the neuroscience of ethics today is far less developed than the ethics of neuroscience and may not progress as quickly, it will be the area with significant implications for the way ethics is approached in the 21st century (Roskies 22). Thus, while the ethics of neuroscience asks questions relating to the ethical implications of a certain type of neuroscience research project, the neuroscience of ethics asks how a better understanding of the biological basis of moral cognition and behavior might influence and modify ethical frameworks.

It is also important to provide a distinction between the fields of bioethics and neuroethics. While bioethics concerns the ethical, social, and legal issues that arise in biomedical research, neuroethics applies to the field of neuroscience specifically and raises further ethical questions. Neuroethics is a unique area of study, as new ethical issues are arising as neuroscience continues to provide unprecedented ways to understand the human mind and to predict, influence, and even control it. Additionally, as the field of neurotechnology continues to rise, so do its ethical dilemmas. In *The Oxford Handbook of Neuroethics,* Ruth Fischbach and Janet

Mindes, a Co-founder and Consultant respectively with the Center for Bioethics at Columbia University, outline various issues within the field of neurotechnology as they state that "technological and biomedical advances relevant to the brain—brain surgery, brain imaging, neuroengineering, neurogenetics, and others—will continue to spawn significant questions" (344). Neuroethics is needed because the brain is symbolically and biologically a crucial organ, and people with brain "disorders" are often particularly vulnerable individuals for whom the field of neuroethics becomes especially important. The tension between the advancement of technology and neuroscience exists because neuroethicists will consistently confront "the technological imperative: if technology exists, use it. But they will need to recall the bioethics mantra: it is not what you can do, it is what you should do" (345). The *Oxford Handbook* created a helpful taxonomy of neuroethical questions which adequately summarizes the field of neuroethics. The categories range from the "technologically-driven questions with wide implications for society" to the applied "philosophical, definitional, legal, cross-cultural, and psychosocial questions relating to the meaning of personhood" (350).

To deal with these neuroethical questions (and others), Dr. Roberta Berry, Director of the Law, Science and Technology at the Georgia Institute of Technology, uses a framework to determine whether an issue can be classified as ethically fractious. There are five characteristics that help determine if a problem is fractious and the outlined criteria address whether an issue is novel, complex, ethically fraught, public, and divisive (or some combination of them). The framework includes "Six Skills for Addressing the Characteristics of Fractious Problems to Advance Understanding and Potential Resolutions." These skills "operationalized the navigational approach by specifying six navigational skills anchored in the set of process virtues ported over from contextualized ethics and common law decision making" (Berry 697). These

six navigational skills, also referred to as the 6 "P's" include: perspectives, precedent, prediction, possibilities, persistence, and principles. The goal of the six "P's" is to apply them to ethically fractious neuroscience issues and guide thought and resolutions when addressing neuroethically fraught or divisive issues.

This framework can also be applied to fiction. From Plato to Nietzsche, the importance of stories in ethics has been recognized by many philosophers as a way to provide a description of moral cases. When fiction, specifically science fiction, integrates neuroscience and neurotechnology, it creates a world for readers to imagine and address relevant ethical issues. The creation of a fiction medium, then, helps readers to envision themselves in the place of another. In "The Role of Fiction in Bioethics," bioethicist Sarah Chan argues for the role of ethics in fiction because the "usefulness of fiction and imagination in bioethical discourse is evident when one considers that hypothetical scenarios, thought experiments and case studies are also a form of fiction" (398). As fictional works, *Flowers for Algernon* and *Speed of Dark* confront the neuroscience of ethics as each deals with experimental neurotechnology in ways that "cure" disability. The sole reason both novels can be categorized within the "science fiction" genre is their use of technology as a "cure" for their neurodivergent protagonists. Thus, it is relevant to use the 6 P's framework, as well as the field of neuroethics as a whole, to confront the social, legal, and ethical implications of such "cures" in both novels.

The Ethics of Neuroscience

Fictional works provide readers with the opportunity to understand neuroethics by creating resonances with personal experiences, both real and imagined. Science fiction is also particularly effective in eliciting these responses, as it engages empathetic responses to develop

moral intuitions, which can then be analyzed in a structural manner. The ethics of neuroscience, specifically neuroscientific research involving technology, haunts *Flowers for Algernon* and *Speed of Dark* as the novels' protagonists confront the respective "cures" available to them and the ethical implications of those cures. *Flowers* addresses a number of important ethical issues regarding the ability of experimental subjects to understand how an experiment might affect their lives and to give informed consent based on this knowledge. Further, it indicates the obligation of scientists performing an operation to ensure their subjects are aware of potential risks of the surgery as well as the ethics surrounding gaining informed consent, especially from individuals with diminished capacity. *Speed of Dark* introduces similar issues regarding the responsibility of scientists and researchers to disseminate accurate information regarding experimental procedures and to gain informed consent from individuals with autism. Both novels present issues relating to experimental testing on humans after conducting their respective operations only on animal subjects. The issues introduced in *Flowers* and *Speed of Dark* allow readers to consider the ethics of neuroscience research in a fictional context, while also considering the relevant ethical dilemmas of experimental surgeries for neurodivergent individuals who may not be physically able to provide consent.

In *Flowers,* Charlie begins his story with a progress report entry briefly explaining that he was recruited for a potential surgery. Immediately, both the researchers and reader view Charlie as a subject of the upcoming surgery because his voice exists solely inside the progress reports. The inaugural progress report reads, "I hope they use me becaus Miss Kinnian says they can make me smart. I want to be smart" (Keyes 3). Although Charlie's desire to become "smart" is rooted in his desire to be like others, he remains unaware of the potential risks of the surgery. His comment raises the issue of how much people are telling him as well as what it means to "be

smart." The researchers remain unaware of the outcome of the surgery, how "smart" it will make Charlie, and the long-term effects Charlie might endure after the operation. It becomes clear through Charlie's progress reports that he does not understand what the surgery involves or its potential side effects. To an extent, the research team capitalizes on Charlie's limited understanding, using him as their first, willing human subject to evaluate a half-tested theory. At the research conference, Charlie notices Algernon's increasingly erratic behavior and arrives at the most terrifying realization: the researchers do not know any more than he does about the surgery and its effects. Based on Charlie's progress reports, he does not understand the potential harm the experimental surgery may wreak on his mental and emotional states, and its potential to alter his life permanently. In his third progress report, he writes, "[Dr. Strauss] said you know Charlie we are not shure how this experiment will werk on people because we onley tried it up to now on animils" (Keyes 6). As Charlie remains unphased by this remark, it is reasonable to conclude that he does not fully comprehend the surgery's high risk for causing harm. Further, Dr. Strauss failed to mention the surgery had not been tested successfully and thoroughly on the animals. The reader (in conjunction with Charlie) later learns that the surgery remained successful with only a singular animal subject, Algernon, whose mental and physical state eventually declined. Thus, in *Flowers,* the research team was willing to recruit and use Charlie for an experiment that had not been thoroughly tested on a single animal. In Anthony Thompson's *Walking the Tightrope,* he argues that it is the responsibility of researchers and scientists to provide a method in which obtaining informed consent, especially from individuals with disabilities, is crucial to engaging with ethical science practices. With respect to the medical model of research, he writes:

> According to the medical model of research, researchers use informed consent procedures to reduce risk to participants, while factoring in the utility or impact of a project's potential outcomes. To conceive research projects primarily through utilitarian considerations may overlook or minimize the participation of people with disabilities in the informed consent process. For example, researchers, historians, and advocates have exposed the subtle (and sometimes not-so-subtle) transgression of human rights vis-a-vis people with developmental disabilities in institutions. (96)

Thompson argues that medical-consent models are not adequate for certain research protocols, especially for individuals with disabilities. He asserts that "the maltreatment of people with disabilities and the immediate need to rectify these abuses warrants a research design that 'uncloaks' these issues in a timely manner" (Thompson 96). The research design in *Flowers* does ensure that Charlie is informed and understands before he provides consent to the surgery. The ability to give informed consent also relies on access to information, in this case, about the experimental procedure.

However, Charlie receives little to no information about the experiment or the potential risks involved. He only demonstrates knowledge of the physical risks associated with the procedure, noting that he does not, "care if it herts or anything because [he is] strong and [he] will werk hard" (Keyes 6). Charlie, only cognizant that the act of surgery might cause physical pain, remains unaware that the surgery may cause permanent damage to his existing mental state and may not work at all. Although Professor Nemur announces, "We are sure theres no fiscal danger for you but there are other thigns we cant tell until we try it" (Keyes 12), it is clear that the act of surgery itself is inherently a dangerous phenomenon. Further, Professor Nemur reveals that there are potential risks: "I want you to understand this mite fale and then nothing would

happen at all. Or it mite even succeed temporary and levee you werse off then you are now… If that happins we will have to send you bak to the Warren state home to live" (Keyes 12). The researchers never announce that the surgery might alter his social life or his ability to interact with others. They never go into greater depth about how Charlie's cognitive state could decline or what that might entail for his ability to read, write, or communicate with others. In fact, as Charlie struggles grammatically to record his conversation with Professor Nemur, it remains clear that he does not fully understand the procedure's risks. In response, he says "I said I didnt care because I aint afraid of nothing… I got my luky rabbits foot and I never breakd a mirror in my life" (Keyes 12). Superstition guides Charlie's decision to take part in the surgery, further emphasizing his inability to grasp the potential danger of the surgery itself and his inability to give informed consent. To understand Charlie's position with regard to giving informed consent, it is helpful to turn to the Stanford Encyclopedia of Philosophy entry on Informed Consent.

The idea of informed consent is more closely defined in the encyclopedia, in which Nir Eyal, a writer for the *Journal of Medical Ethics*, states the following:

> Informed consent is shorthand for informed, voluntary, and decisionally capacitated consent. Consent is considered fully informed when a capacitated (or "competent") patient or research participant to whom full disclosures have been made and who understands fully all that has been disclosed consents voluntarily to treatment or participation on this basis. (Eyal)

The phrase "decisionally capacitated" means the ability of subjects to make their own medical decisions. Individuals who cannot make their own decisions include "persons who are unconscious, individuals with severe brain damage, infants and very small children, those who are born with severe cognitive impairment, and those in the advanced stages of dementia" (Silver

& Francis 2009). However, this definition becomes complicated in subtle cases, such as those involving individuals who have some but not all of the mental capacities of ordinary adult agents. Further, Eyal writes in the encyclopedia, the main argument for informed consent revolves around protection, autonomy, prevention of abusive conduct, trust, self-ownership, non-domination, and personal integrity.

Although Charlie is never prompted by the research team to say *why* he wants to become "smart," he does express a desire to be like others, such as his friends at the bakery or Alice Kinnian, with respect to reading and writing abilities. The research team abuses this desire, using it as a mechanism to coerce Charlie in his decision to become a subject in the operation. In fact, there is evidence that the research team understands Charlie's diminished capacity and his inability to provide proper consent for the surgery because the team attempts to contact Charlie's immediate family. In "Measuring Decision-Making Capacity in Cognitively Impaired Individuals," Dr. Jason Karlawish, professor of medical ethics and neurology at the University of Pennsylvania, defines capacity with four decision-making capabilities:

> They are understanding, appreciation, reasoning, and choice. Understanding is the ability to comprehend the meaning of information, such as the details of a research protocol, its alternatives, and the benefits and harms of the options. Appreciation is the ability to recognize how information applies to a person, information such as a diagnosis and the risks and benefits of the range of possible solutions for that diagnosis. Reasoning is the ability to compare options and infer the consequences of choices in a logically consistent manner. Expressing a choice is the ability to state a decision. (3)

In his article, Dr. Karlawish explains that individuals who do not meet these criteria are categorized as possessing "diminished capacity," thus showing the inability to make informed

decisions regarding their involvement in a procedure. Although Charlie does meet the final criteria of "choice" in the aforementioned set of capabilities when he expresses his willingness to participate in the operation, he lacks all other capabilities. Charlie does not show an understanding of the surgery, an appreciation of the risks involved, or a reasoning process by comparing alternative options in his quest to become "smart."

In his initial reports, Charlie writes, "They said they got to get permissen from my familie but my uncle Herman who use to take care of me is ded and I dont remember about my familie. I dint see my mother or father or my littel sister Norma for a long long long time" (Keyes 6). Here, the reader learns that Charlie's relationship with his family is strained, as not only does Charlie not know where his family is located; he also does not know if "Maybe their ded to" (Keyes 6). Despite this strain, the research team seeks out Charlie's sister, Norma, and eventually receives her consent to perform Charlie's surgery. After Charlie becomes hyperintelligent, he bitterly tells Nemur, "From what I remember of her, I imagine she'd have given you approval for my execution" (Keyes 194). This comment highlights the gap between Charlie and his family, leaving Keyes' readers to consider how the idea of consent is addressed within the scientific community. Are distant family members the best people to serve as medical proxies for experimental surgeries? Who is responsible for having a patient's best interests in mind when making decisions surrounding consent? Here, the literature reflects back on the science as Keyes unveils the strained relationship between Charlie and his sister, raising the issue that family members cannot always be trusted to represent the best interests of a cognitively impaired person.

Further evidence of Charlie's diminished capacity and inability to give adequate consent to the surgery can be seen when his progress report reveals that the research team knows his IQ.

Charlie admits, “I felt good when he said that not everybody with an eye-que of 68 had [motivation] like I did” (Keyes 11). In a psychological model, intellectual functioning is commonly measured by the intelligence quotient (IQ), which represents a total score obtained from a series of standardized tests developed for evaluating human intelligence. Lee et al. (2021) define a “low” score in their research paper, stating, “IQ test score has a median of 100 and a standard deviation of 15. A score of 70 or below (two standards below the median) indicates intellectual limitations.” Thus, it is appropriate to conclude that Charlie’s low IQ score, coupled with the researchers’ decision to find a relative to provide consent, indicates Charlie’s diminished capacity and inability to give consent to participate in the surgery. Of course, it is important to acknowledge that IQ is not solely representative of an individual’s intelligence capacity to learn. In *The Power of Neurodiversity,* author Thomas Armstrong argues:

> It is strange that anyone could take someone’s rich potential and complexity and reduce it to a single number. It is also unjust that differences in IQ scores between people (an IQ of 101 versus 69, for example) could affect an individual’s attitude toward them so profoundly. IQ scores are just numbers, yet as a nation the United States has been profoundly affected by the philosophical school of positivism, the idea that truth can be found only in numbers, statistics, or equivalent empirical data. (143)

It is also important to acknowledge the pushback on the idea of using IQ tests to determine an individual’s potential. Professionals continue to challenge the sacrosanct nature of the concept of intelligence and by extension, the IQ score. However, Charlie’s score was only one of the several factors that indicates his inability to provide proper consent to the research team.

Whereas *Flowers* focuses on individuals capitalizing on Charlie’s diminished capacity to achieve consent, *Speed of Dark* focuses on coercion and undue inducement to gain Lou’s

consent. Throughout *Speed of Dark,* Lou's problem is not one of diminished capacity (although some could argue that autists also classify as individuals with "diminished capacity") but rather, an issue of coercion, undue inducement, and gaining access to information about the surgery itself. Scott Anderson, another writer for the Stanford Encyclopedia of Philosophy, defines coercion as "a threat to make someone seriously worse off than she is or should be, unless she consents" (Anderson). The majority of *Speed of Dark* is not plot-driven, but rather thought-driven. It is thought-driven in the sense that Lou spends nearly the whole book deciding if undergoing the experimental surgery is the right choice for him. As discussed in the previous chapter, Lou's eventual decision to take part in the operation does not stem from his desire to become "smart," but rather, to understand the world differently. However, the initial idea of the experimental surgery, brought to him by Mr. Crenshaw, is delivered in a coercive manner. In a conversation between Mr. Crenshaw and Aldrin regarding the surgery for the autists in Section A, Mr. Crenshaw admits, "'I can't imagine anyone *wanting* to be like that," Crenshaw said. 'And if they do, that's a matter for a psych evaluation… Preferring special treatment to a cure. That would be some kind of mental imbalance. Grounds for serious consideration of termination'" (Moon 16). Essentially, Mr. Crenshaw plans to threaten Section A, ultimately coercing the workers with autism to take part in the experimental surgery to "fix" what Mr. Crenshaw views as "sick" or "damaged" within the individuals. Threatening a worker's employment classifies as a form of coercion and meets the previously stated definition of coercion in that without employment, Lou would be stripped of his autonomy, vastly altering his personal and professional life.

Throughout the novel, Mr. Crenshaw, the obvious antagonist and villain, pushes Aldrin to convince Section A to participate in the surgery. Once Mr. Crenshaw realizes he is ineffective in

coercing Section A, he uses Aldrin, the direct manager of Section A and someone the section trusts, to attempt to persuade the autistic workers to volunteer for the surgery. To Aldrin, Mr. Crenshaw says, "'I want to make it clear to your people what the options are. One way or another, they have to quit being a drag on the company: give up their luxuries now or take the treatment and give them up if it's really the autism that makes them need that stuff" (Moon 132). In essence, Mr. Crenshaw is willing to risk the life of every employee in Section A for an experimental treatment that may or may not "cure" their autism, since there is no clear evidence that it will work. Eventually, Mr. Crenshaw turns to threatening Aldrin's job as well, leaving Aldrin to believe his employment, too, is at risk unless he can convince Section A to choose the treatment. Aldrin, who is later revealed to have an autistic brother, worries about his ability to pay his brother's bills for residential treatment if he is asked to leave his job. Thus, Mr. Crenshaw's coercion works, and at a subsequent dinner with Aldrin and the workers from Section A, Aldrin convinces several of the workers to volunteer for the operation.

Lou refuses to be coerced in his decision-making process regarding the surgery, and instead decides he must understand the experimental surgery before making a decision. Unfortunately, the undue inducement and lack of information provided about the operation presents several issues for Lou's ability to make an informed decision. In "The Regulation of Informed Consent on Human Experimentation," author and professor at the University of Chicago Law School, Maria Woltjen argues that legal definitions of informed consent typically comprise three elements: capacity, voluntariness, and information. As the novel progresses, it remains difficult to judge whether Lou meets these three criteria. When the head researcher of the project tells Section A, "You will receive full pay but not the stipend for research subjects. You will be considered as employed at another site, with the employment being participation in

the research. The company is prepared to cover all medical expenses arising from treatment" (Moon 290). Section A is also promised a five-year severance package in the case that the treatment does not work, and its employees are guaranteed to have all future medical expenses covered for an indefinite amount of time. Although the package for volunteering for the treatment is full of enticing perks, they constitute undue inducement. Undue inducement, defined as "something being offered that is alluring to the point that it clouds rational judgment" (Anderson), is a form of deceit that makes proper reasoning difficult.

As Lou continues to ponder the potential of the surgery, he attempts to learn more about the surgery, and by extension, the neuroscience involved. Lou reads everything from an introductory textbook on organic chemistry, biology, and anatomy to advanced books beyond college-level biochemistry and neuroscience. Lou uses knowledge to guide his thinking and decision-making processes. Unbiased, concrete facts allow Lou to develop a level of confidence about the surgery that no amount of coercion or medical perks can provide. As he begins to understand more about neuroscience, he asks one of the researchers for a diagram of a brain scan used in their presentation. In response, the researcher argues, "'I don't think that's a good idea, Lou. This is still proprietary—very confidential. If you want to know more, you can ask me or your counselor questions and you can look at the slides again though' —he chuckles—'I don't think they'll mean much since you're not a neurologist'" (Moon 248). By denying Lou access to a complete understanding of the experiment, the researcher condescendingly disrespects Lou and deprives him of agency. He strips Lou of the ability to interpret the slides in front of him, leaving Lou to memorize the information to the best of his ability and retain the images until Lou can consult a neuroscience textbook. This gatekeeping of information is more extreme in *Speed of Dark* than in *Flowers,* especially as Lou has the cognitive ability to understand the surgery and

its risks. This ethical dilemma is compounded in the researchers' decision to withhold important information because they stereotype Lou as someone who lacks the intelligence necessary to interpret the surgery's procedures and risks. However, similar to Lou in *Speed of Dark,* Charlie, toward the end of *Flowers,* realizes that the researchers have been gatekeeping information regarding how his cognitive state is destined to decline like that of Algernon. In comparison to *Speed of Dark,* once Charlie has capacity, he learns information about the operation in spite of the researchers, rather than because of them. It is also important to note that the surgery, as in *Flowers,* has only been completed on nonhuman subjects. The surgery has only been accomplished successfully (as far as the researchers know thus far) with chimpanzees, not with human subjects.

Eventually, Lou decides, "I think I may want to try this treatment. I do not have to. I do not need to: I am all right as I am" (Moon 300). Lou decides to participate in the experimental surgery not because he is coerced or threatened with being fired from his job (at this point), but rather, because he desires to learn and pursue new areas. Although he does not fully understand the surgery, he accepts the fact that he cannot know all of the risks and decides to consent to the operation. In reference to the previously mentioned definition of informed consent, it is clear than to an extent, Lou demonstrates his possession of all three (capacity, voluntariness, and information). He has the capacity to make an informed decision as well as the voluntariness and the ability to access information. Lou's proactive search for any and all details related to the field of neuroscience provides a strong foundation for his confidence to grow and self-teach the most relevant information of the surgery, allowing him to make an informed decision to proceed with the operation. However, his access to information about the surgery itself remains difficult as the researchers gatekeep certain elements of the procedure, limiting how much knowledge they share

with Section A. In fact, meeting the criteria of "capacity" and "voluntariness" becomes murky for Lou as well, as the reader learns how Mr. Crenshaw coerces Lou and other Section A members to participate in the surgery, threatening their employment and livelihood. Thus, while Lou has the potential to meet all criteria for informed consent, Moon makes it unclear as to whether it is actually achieved. Unlike in *Speed of Dark,* it is clear that in *Flowers,* Charlie does not possess *any* of the criteria for informed consent as he does not initially possess the capacity (and thus, no genuine "voluntariness") or realistic information about the surgery and its risks.

Although *Flowers and Speed of Dark* are works of science fiction, proposing experimental operations to "fix" cognitive disability and autism, they remain useful cases to study the neuroethical implications of technology as a "cure." However, the role of fiction, especially science fiction, in examining philosophical questions is not limited to medical ethics and neuroethics. Fiction can also be used to explore problems of moral philosophy. Science fiction allows readers to imagine different worlds, and thus different realities for the people of these worlds. These novels do not ask the question of whether neurodivergent people can "cure" themselves, but rather *should* they, and why? While *Speed of Dark* presents the rationale for *why* one might choose to undergo an experimental surgery, *Flowers* helps provide potential consequences for the decision to do so. Thus, science fiction plays a role in understanding the ethics of neuroscience research, especially as the field continues to advance. As works of fiction allow readers to consider ethical problems that fall outside neurotypical experience, they also enable readers to personalize and imagine the ethical issues involved and issues that fall outside the limits of common experience. To a great extent, the ethical issues raised in *Flowers* and *Speed of Dark* function as thought experiments that stretch the boundaries of ethical imagination. These novels seek to expand the reader's understanding and do not merely inculcate one opinion

or another but rather, set the reader on a journey of ethical development in parallel with the narrative experience.

Treatment, Enhancement, and the 6 P's

Within neuroethics, one of the most important criteria when deciding if an issue is ethically fraught lies in the distinction of whether it can be classified as an "enhancement" or "treatment." Thus, it is helpful to first provide definitions for both. In bioethics, the term "enhancement" is "usually used […] to characterize interventions designed to improve human form or functioning beyond what is necessary to sustain or restore good health" (Juengst 29). Neuroenhancement, (also referred to as "cosmetic neurology" by professor of neurology Anjan Chatterjee), refers to neurological interventions that can enhance movement, mentation, and mood in healthy individuals. In his article, "Neuroethics: Cognitive Enhancement," philosopher Walter Glannon argues that cognitive enhancement also refers to "interventions in the brain that improve attention, concentration, and information processing in executive functions such as reasoning and decision-making" (1). He outlines three main components of enhancement: augmenting, diminishing, and optimizing. Thus, by augmenting or diminishing certain aspects of cognition, an optimal level of function can be achieved. On the other hand, "treatment" refers to helping people who need medical treatment and thus administering a form of medical therapy to help individuals become healthy. In other words, what medicine chooses to treat is defined as disease, while altering what it does not treat is enhancement.

Dr. Paul Root Wolpe, a professor of Medical Ethics, Bioethics, and Psychiatry who currently directs the Center for Ethics at Emory University, recognizes that, "the philosophical question of enhancement is about categorization: what do terms such as 'average' or 'normal'

function, or even ‘disease’ and ‘enhancement’ mean when we can improve functioning across the entire range of human capability” (389). Essentially, the primary distinction between the enhancement and treatment is that enhancement refers to pushing someone over an established “baseline,” while treatment merely involves bringing someone to meet baseline.

The ability to categorize a potentially dangerous procedure as either an enhancement or a treatment allows for a deeper understanding of the issue itself. Thus, in *Flowers* and *Speed of Dark,* it is interesting to consider whether the neurotechnological operations used to “cure” each protagonist’s disability can be categorized as an enhancement or treatment respectively. In *Flowers,* Charlie is presented as an individual possessing an IQ of 68 and someone who struggles with reading, writing, and retaining information. At the research conference where Nemur presents his IQ-boosting project, he states that Charlie’s limited cognitive abilities are a direct result of his phenylketonuria (PKU). The Mayo Clinic defines PKU as “a rare inherited disorder that causes an amino acid called phenylalanine to build up in the body. PKU is caused by a defect in the gene that helps create the enzyme needed to break down phenylalanine.” When this enzyme (phenylalanine hydroxylase or PHA) is deficient, phenylalanine accumulates and is toxic in the brain. According to the National Organization for Rare Disorders, “Without treatment, most people with PKU would develop severe intellectual disability.” In *Flowers,* Charlie never acknowledges his PKU, and the reader learns about the diagnoses during Nemur’s presentation at the research conference: “We don’t know exactly what causes the type of phenylketonuria that Charlie was suffering from as a child… whatever it was resulted in a defective gene which produces a, shall we say, “maverick enzyme” that creates defective biochemical reactions” (Keyes 113). Although the description Nemur provides does fit the definition of PKU, it does not explain how the surgery performed provides adequate treatment. Nemur explains, “we remove[d]

the damaged portions of the brain and permit the implanted brain tissue which has been chemically revitalized to produce brain proteins at a supernatural rate" (Keyes 114). The idea that Charlie received a "chemical injection" that could improve the function of a "defective enzyme" and that this would lead to any substantial structural brain changes is unlikely. It is even more unlikely that this form of treatment would lead to the form of hyperintelligence Charlie possessed post-operation. Although the science is not sound, the imagined possibilities that stem from the science fiction novel itself allow readers to meditate on the impact of the treatment for individuals with PKU and other intellectual disabilities. Taken together, Charlie's low IQ and phenylketonuria allow for Charlie's operation to be classified as a treatment rather than an enhancement. However, as Charlie reaches a level of intelligence that exceeds the norm, it becomes evident that operation has not only treated Charlie's previous condition but has allowed for an extreme enhancement of his abilities. However, despite hyperintelligent Charlie's heightened intellectual abilities, the categorization of the operation remains one of treatment, as the initial goal of the surgery was merely to bring Charlie up to baseline.

Whereas Charlie's operation can be classified as a treatment for aiding his initially low IQ and intellectual difficulties, Lou's operation qualifies as one of enhancement in that it ultimately aims to "fix" an already healthy state. Unlike in *Flowers,* in *Speed of Dark,* the most important changes happen before the narrative arrives at the drama around the medical intervention. Lou does express a type of "deficit" in a range of social interactions, from his inability to express his feelings toward Marjory to his difficulty with articulating anger toward Mr. Crenshaw. He recognizes his shortcomings in conversations with other characters when he struggles with social interactions. After Mr. Crenshaw scolds Lou for arriving late to work (because someone slashed Lou's tires), Lou admits, "I am struggling to interpret his words; they

sound farther and farther away, less like meaningful speech. It is hard to think what the right answer is" (Moon 110). Lou often finds conversations difficult, as he struggles to discern what might qualify as a "correct" response to someone. He has been "trained" to some degree to respond with the neurotypically "correct" response, rather than how he would otherwise express himself. Lou understands that he frequently fails to interpret body language, facial expression, and other cues that provide insight into others' emotions. When Lou reflects about others' opinions of the surgery, he says, "It means more than they say; everything they say means more than it says. Beyond the words is tone; beyond the tone is context; beyond the context is the unexplored territory of normal socialization" (Keyes 252). Lou understands that there is more to a communication than can be explicitly understood with just words; the true meaning lies in the implicit. Lou understands that underlying each social interaction is a type of dance, a back and forth, similar to his experience with fencing. However, although Lou often struggles with social interactions, he shows no deficit in his ability to learn new information. He quickly learns more about his own brain, religiously reading and understanding a highly advanced textbook about neuroscience:

> It is on the last page of that chapter that I find a sentence so overwhelming that I have to stop and stare at it: "Essentially, physiological functions aside, the human brain exists to analyze and generate patterns." My breath catches in my chest; I feel cold, then hot. That is what I do. If that is the essential function of the human brain, then I am not a freak, but normal. (Moon 175)

Lou finds the information in the textbook impossible to believe. He has experienced a society that has, for as long as he has been alive, labeled him as the "other," constantly forcing him to act against his autism. He asserts, "This cannot be. Everything I know tells me that I am the different

one, the deficient one" (Moon 175). After Lou accepts the explanation in the textbook to be true, he ponders the idea that perhaps *he* is the most "normal" of all. Eventually, Lou discovers through learning, living, and being with others that his brain is neither deficient nor stagnated, but rather constantly changing. In Stephen Dougherty's journal article, "Autism and Modular Minds in Elizabeth Moon's *The Speed of Dark,"* he argues that "the most important thing about brains in [the novel] is not that they are genetically prewired, and the important thing about human development and behavior is not that it is programmed in advance" (Dougherty 41). Lou demonstrates the ability to change in different aspects of his life, from the way he learns to confront his boss to his acknowledgement that he loves Marjory. Dougherty argues, "at issue in the novel is how our experiences give shape to who we are, and even more importantly, what we can become, and how we become" (Dougherty 41). In many ways, Lou demonstrates a heightened ability to experience the world as he learns to act or "perform" in a neurotypical sense as well as with his autism.

Although Lou demonstrates the ability to change and meets all the criteria necessary to be classified as a healthy individual at baseline (and even above baseline in areas such as pattern recognition and mathematics), he proceeds with the surgery. Throughout *Speed of Dark,* every character refers to the experimental operation as a "treatment," yet it meets the criteria that would categorize it as an "enhancement" in that it qualifies for the "diminishing" (of autism) in the previously outlined definition of enhancement by Walter Glannon. Although the trajectory of Moon's narrative argues against the idea that Lou's condition constitutes something absolutely different from a hypothetically normal condition of being, Moon complicates this idea with her ending. Lou receives the surgery and eventually, seven years later, travels to space. The operation has "cured" him of his autism, allowing him to experience the world differently. He

acknowledges, “I miss Tom and Lucia and Marjory and my other friends from fencing, who helped me so much in the early years of recovery” (Moon 339). To an extent, although the operation was intended to rid Lou of his autistic “deficits” such as his difficulty with social interactions, he is now more alone than ever. The operation has allowed Lou to live a new, different life, but it is not “enhanced” in the way the reader hopes. Having lost connection with his old friends and taken up new residence (within the confines of a spaceship), the new Lou is untouchable and impossibly distant. Daugherty argues, “He has become that which he was afraid he was all along but which he really was not: an autist in the classic sense, locked away in his own private world, floating outside and beyond all possibility of human connection” (52). Lou’s “enhancement” alters his life completely, leaving readers to question Moon’s decision to conclude the novel by “curing” Lou of his autism. Unlike the demonstrated need for treatment Charlie expresses in *Flowers*, Lou’s operation represents a neuroenhancement that wholly alters his life, ultimately raising important questions regarding the ethicality of “curing” autism as well as the idea of “curing” other forms of neurodivergence.

While examining how the novels’ use of neurotechnology can be classified as either a treatment or enhancement allows for a better understanding of how society views disability, it is helpful to turn to the 6 P’s framework to provide potential resolutions for the use of such technology. It is important to remember that neuroethics is defined as understanding the ethical, social, and legal implications of a particular issue. While the previous section of this chapter focused on the “ethics” of neuroethics, the 6 P’s framework helps outline the “legal” and “social” implications of a given issue. Returning to Moon’s ending of *Speed of Dark,* the P of “persistence” can be addressed. In her framework, Dr. Roberta Berry defines “Persistence” as a strategy that:

> Considers the social understanding and policy resolutions as part of a dynamic, incremental, iterative, ongoing process requiring persistence in response to changed conditions and to feedback from previous choices, to advance understanding of and potential resolutions addressing novelty, complexity, ethically fraught nature, public nature, and divisiveness. (Berry 697)

In *Speed of Dark,* persistence can be applied with respect to challenging the "social understanding" as well as the response to "changed conditions and feedback from previous choices." At the end of the novel, Lou acknowledges the fact that the surgery has created a gap between his previous life and his current one, specifically with his friends. In the final pages, Lou admits, "I miss Linda and Chuy; I hoped they would take the treatment when they saw how it worked for me, but Linda didn't until after I finished my doctorate last year. She is still in rehab. Chuy never did." (Keyes 339). Hypothetically, if there were a "cure" for autism, it would be crucial for policymakers to take note of the divisiveness it creates. If a new individual (such as Linda in this case) was considering taking part in the surgery, it would be important for there to be persistence in improving the surgery and following up with individuals who did participate in the surgery.

Similarly, one of the most difficult aspects of *Speed of Dark's* ending, and an example of the previously mentioned "divisiveness," arrives when coping with new-Lou's disinterest in Marjory. Lou admits, "I know the Lou-before loved Marjory, but nothing happened inside when I looked at her afterward" (Moon 340). Over the course of the novel, the reader cannot help but develop an emotional attachment to Lou and Marjory's relationship. The ending releases their relationship, further exposing potential ethical issues with the surgery if it can completely augment one's feelings toward another. On the other hand, the lens of persistence can also be

applied to helping change the societal view of autism, shifting it from a "disability" to just an ability. In this sense, a different kind of "persistence" is needed to prevent a surgery, such as the one in *Speed of Dark,* from infiltrating its way into society. Perhaps, a persistent effort is needed to protect individuals with autism, not just from "curative" options, but from coercion and other similar themes that were presented in the novel.

While "persistence" can be used to address some of the social issues raised in *Speed of Dark,* "principles" can be used to analyze some of the legal implications highlighted in *Flowers.* Using Dr. Berry's framework, principles is defined as the ability "Strive to identify limited, non-comprehensive consensus principles that capture shared understanding and policy resolutions adequate to a persistent process." A closer definition also includes how principles can be developed to cope with the novelty, uncertainty, and complexity of certain issues. When Charlie realizes he has surpassed the knowledge of the research team in *Flowers,* an important moment exists for the necessary intersection between science community and the public. As Charlie learns that Professor Nemur and Dr. Strauss have not read the most recent neuroscience research in an area relevant to his surgery because it is only available in Hindi, he is beyond baffled. He confesses, "To hear [Strauss] admit that both of them were ignorant of whole areas in their own fields was terrifying" (Keyes 134). Although Charlie is considered a "genius" at this point for his proficiency in linguistics, physics, mathematics, science —and nearly every other area of academia— he fails to cope with the reality of the situation due to the lack of principles established by Nemur and Strauss.

Prior to the surgery, the research team did not outline any principles to deal with the novel or complex issues of the experimental surgery or to make Charlie feel like a person throughout the process. Charlie reflects, "No one considered me an individual—a human being"

(Keyes 143). On a societal scale, this moment brings science and policymakers into the conversation as the disconnect between the two still exists as one of the most glaring issues. In Dr. Bethany Goldblum's article, "Forget Philosopher-Kings, We Need Scientist-Policymakers" she argues, "This lack of occupational diversity in Congress, especially the lack of leaders from technical science backgrounds, impoverishes not only the organizational culture of Congress, but also its ability to critically engage scientific issues and make the best policy choices" (2).

Although Keyes does not directly discuss policymakers' role in approving the experimental surgery, it can be deduced that there were no scientist-policymakers providing the green light for its approval. This brings back Charlie's zealous complaint that because Nemur was unable to read Hindi, he remained unaware of a competing enzyme theory. If a bilingual Hindi-speaker had been part of the team, or had been consulted, the regression of Charlie's intellectual abilities could have been prevented. Without occupational diversity in political and legal environments, it is difficult to progress (or establish) a set of "principles" to further ethical science. To bridge the gap between science and policy, collaboration between the two entities must ensue. One of the core themes (and discussed in the previous two chapters) of *Flowers* is the potential perils of pursuing "forbidden" knowledge. Yet, through a neuroethics lens, Keyes pushes this idea further, underscoring how the danger ultimately stems from an individual's sole pursuit of knowledge, not from a group collectively working to find answers. Thus, working together to establish an ethical set of principles is necessary for advancing science, policy, and legislation.

While the previous "P's" directly reference issues discussed in the novels, the final "P" of "possibilities" analyzes how *Flowers* and *Speed of Dark,* works of fiction, can help incite change on a societal level. The idea of possibilities is that it "Employs imagination and flexibility to

expand the range of possible understandings and policy resolutions, by brainstorming, reflection, role-playing, reference to literature, film, or other devices to advance potential resolutions" (Berry 697). Science fiction can be used to inspire new inventions within the scientific community. For example, American inventor Simon Lake, now known as the father of the modern submarine, was captivated by the idea of undersea exploration after reading Jules Verne's *Twenty Thousand Leagues Under the Sea,* later creating the *Argonaut,* the first submarine to operate successfully in the open ocean. In 2014, a California biotechnology firm was inspired by *Star Trek's* "The Replicator," which used the technology of a transporter to dematerialize and then rematerialize matter in another form. The company harnessed the capabilities of a three-dimensional printer to produce 3D-printed liver tissue, allowing for medical research on non-human organs. I cite these examples not to argue that the experimental operations such as the ones presented in *Flowers* and *Speed of Dark* should be developed, but rather to demonstrate the power of science fiction in furthering imagination, creativity, and ultimately contributing to authentic scientific advancements.

In fact, fictional works in the film industry have even inspired proactive behavior in a political arena. Margaret Atwood's 1985 dystopian novel, *The Handmaid's Tale,* and its recent television adaptation have emerged as one of the most powerful current feminist symbols of protest. Women march with their heads bowed, dressed in red cloaks and bonnets, across the United States, the United Kingdom, Ireland, Argentina, and other countries. Protests emerge when there are calls for decriminalization of abortion in Argentina. They emerge at Ruth Bader Ginsburg's vigil to protest former President Trump's and Senator Mitch McConnell's actions. Because of the novel, the handmaid has become an international protest symbol. Works of science fiction are no different. In a similar fashion, *Flowers for Algernon* and *Speed of Dark*

simultaneously fulfill possibilities for readers to imagine new opportunities for science as well as empower readers to challenge ethically fractious issues and the status-quo.

Conclusion: Fiction's Lessons for Science

Fiction provides a gateway for imagining, inspiring, and questioning the advancement of science. Gene Roddenberry, the creator of *Star Trek* stated, "For me, science fiction is a way of thinking, a way of logic that bypasses a lot of nonsense. It allows people to look directly at important subjects." Science fiction is the arena for scientific thought to unfold. Science fiction authors such as Frank Herbert, Isaac Asimov, and Philip K. Dick, among many others, have created worlds within their novels for readers to imagine new realities and provoke scientific thought. Of course, science inspires literature and fictional stories. As science continues to advance across different areas of research, new ideas to test the limits of science appear within literature, specifically in science fiction stories. However, it is equally important to acknowledge how literature inspires science and can influence the scientific community and the public. Literature and fictional stories provide new ways for readers to think about the questions and issues that science raises. From human cloning in Kazuo Ishiguro's *Never Let Me Go* to imagining the realities of enhanced prothesis in Peter Watt's *Blindside,* science fiction creates worlds for readers to explore the unknown. Both Daniel Keyes' *Flowers for Algernon* and Elizabeth Moon's *Speed of Dark* explore scientific issues concerning the power of neurotechnology in "curing" disability.

Although *Flowers for Algernon* and *Speed of Dark* are works of fiction, they successfully raise important questions for readers, scientists, and society. These two novels are particularly special in that they not only use science fiction as a genre to test scientific questions; they also use neurodivergent protagonists to guide their stories. Thus, through their narration, these novels allow neurotypical readers to access the minds of their neurodivergent protagonists. Both novels offer readers a chance to see the world from a neurodiverse person's point of view, thus

constructing a type of fictional yet realistic niche for readers to adapt to neurodivergent ways of being. Further, it is helpful to return to one of the elements of Thomas Armstrong's "positive niche construction," such as the idea of strength awareness. Through each novel's neurodivergent narration, readers were privy to exploring some of each protagonists' strengths, from Charlie's empathetic nature to Lou's intricate pattern recognition abilities. Thus, these novels also help investigate the ways in which understanding how distinct neurodivergent abilities and strengths can be used and applied to create better, accessible environments for different communities. Within this thesis, I have explored the elements of the stories that challenge readers as well as sharpen our understanding of the role of neurodivergence in science fiction. Analyzing the structure, point-of-view and rhetorical decisions of both novels has ultimately allowed for access to this constructed niche and thus, greater insight into the thoughts, motivations, and feelings of the neurodivergent protagonists.

Similarly, an exploration of some of the novels' most important themes helped sharpen our understanding of how *Flowers* and *Speed of Dark* either constructed, deconstructed, or reconstructed existing stereotypes of intellectual disability and autism. Although both novels engage with stereotypes about individuals with disabilities, Moon's *Speed of Dark* actively works to deconstruct many of the stereotypes that arise in Keyes' *Flowers for Algernon.* Although both novels confront such stereotypes, the neurodivergent narration Moon provides via Lou ultimately allows for a more effective deconstruction of such stereotypes about disability that remain pervasive in society today. Additionally, a thematic analysis provided a platform for considering how these depictions of disability (both past and present) influence the way in which an ableist society continues to view disability. Exploring these depictions, specifically the way in

which each protagonist's disability is "cured" via neurotechnology, raises neuroethical questions surrounding the ethics of neuroscience research.

Taken together, the purpose of exploring these novels was not to determine the "accuracy" of the specific depictions of neurodivergence, but rather to explore how they worked to reinforce (or combat) stereotypes about neurodivergence within the genre of science fiction. In many ways, science fiction as a genre can take more risks than other genres in this area as it assesses how futuristic technology constructs the way in which disability is viewed and how current stereotypes attach themselves to disability. Such stereotypes, as outlined in the introduction (and in the second chapter), are harmful as they create a narrow mindset and categorization of what it means for someone to be neurodivergent. Thus, as a genre, science fiction allows readers to explore and question what this neurotechnology suggests with respect to "curing" or "fixing" people with disabilities, and thus, highlights current understandings of disability. Further, these stories allow us to consider the possibilities and consequences of science (specifically neurotechnology in this case) and ultimately, how fictional works of literature can contribute to science.

Terrence Cave's *Thinking with Literature* outlines some of literature's most important purposes: "literature as an evolved human activity is a multiple phenomenon, a coral reef whose ecology encompasses an extraordinary diversity of forms, expressive possibilities, and potential functions" (142). Science fiction is no different in this respect. The possibilities and functions of science fiction are infinite. Cave proposes: "Literature is by its nature overdetermined and underspecified" (142). The "overdetermination" of literature can be characterized as a "function that literature uses [and] combined with the fact that it is intrinsically permissive, it can take all kinds of risks, explore all kinds of alternatives, without significant consequence in the real

world" (142). Cave's point is compelling, and I would argue that these "risks" and "alternatives" are especially heightened within the genre of science fiction. I would also disagree that literature's imagined alternatives do not impact the real world. Works of literature *do* in fact create the potential for consequences in the real world because fictional realities are adopted as modes for shaping societal thought and advancing scientific developments. The phenomena that are conjured in science fiction, such as the concept of "curing" disability or eliminating neurodivergence with a technological tool, perpetuate negative ideas regarding disability. Thus, it is essential that these works of fiction inspire critical thinking in readers, using novels such as *Flowers* and *Speed of Dark* to serve as case studies for advancing the way we understand neurodivergence, neurotechnology, and the ethical implications of the ideas that science fiction brings to life.

Neurodivergent characters such as *Flowers'* Charlie and *Speed of Dark's* Lou cast much-needed light on the social and cultural forces at work in creating disability oppression and liberation. In *Disability in Science Fiction,* Kathryn Allan argues that "Science fiction and disability studies both affirm the value of imagining, questioning, and shaping alternative ways of being" (33). Both *Flowers* and *Speed of Dark* use neurodivergent characters to rethink concepts of impairment, normalcy, conformity, and self-identity. In these novels, the narrator-protagonists are the most powerful way to interpret these concepts as readers are invited to learn from and with their experiences. The neurodivergent narration provides a lens through which readers are afforded new ways of understanding and experiencing the world. These unreal worlds of difference create interpretive spaces for intersectional analysis and action.

In many ways, the endings of *Flowers* and *Speed of Dark* are poignant and raise interpretive questions regarding the thinking both Keyes and Moon are attempting to inspire in

readers. In short, Charlie's operation is deemed a "failure" as he regresses below his initial level of intelligence, and he decides to spend the remainder of his life in the Warren State Home. Lou's operation is technically deemed a "success" as his autism is miraculously "cured," and he pursues a PhD and fulfills his lifelong dream of traveling to space. Yet, the seemingly "fulfilling" ending is still unsatisfying, as it complicates the novel's position concerning the idea of curing autism. In the end, both Charlie and Lou are further away from the people they care about than they initially were before the surgery. Their relationships with friends, co-workers, and love interests dissolve entirely. Charlie decides he wants to be surrounded by "people like him" and Lou is more alone than ever, floating around in space. Yet, both protagonists exude happiness, appreciation, and love for their new realities. The endings are inconclusive, and thus succeed artistically as well as in their ability to make readers think analytically in ways that surpass the novels' plotlines. The questions are raised yet unanswered, leaving us (as readers) to decide how to interpret each author's respective endings.

However, although the endings remain unresolved, the stories themselves propose new ways of approaching science. Together, *Flowers* and *Speed of Dark* provoke thought for important improvements in the way research is conducted within the science community. Returning to the field of neuroethics discussed in the previous chapter, the "6 P's" are particularly applicable when considering how these novels advance new ways of thinking about the intersection between science and literature. More specifically, because the idea behind the "6 P's" is that it provides a framework for resolving ethically fractious issues within the scope of neuroscience research, it can also serve as a framework when considering how novels engage with such issues.

After reading *Flowers* and *Speed of Dark,* I would like to propose adding a 7th "P" to the framework: protection. Both novels follow a similar plotline in that they explore the idea of experimental procedures to "cure" disability. They also share common themes of their protagonists dealing with coercion, lack of informed consent, and an absence of information about the procedure. Charlie and Lou represent a vulnerable group, as they belong to neurodivergent communities that often struggle to access the same privileges of neurotypical individuals, especially in decision-making processes. In the novels, scientists, researchers, and distant family relatives are the ones to guide and make decisions on behalf of the neurodivergent protagonists. The voices of Charlie and Lou are stripped, and by extension, so is their autonomy and agency. *Flowers* and *Speed of Dark* are not entirely fictitious pieces of work in the sense that they do mirror the unfortunate reality that neurodivergent individuals are often unprotected within the research and clinical space today. My hope for adding a 7th "P" to the current neuroethical framework is that a greater emphasis would be placed on protecting vulnerable groups who have historically suffered from being silenced or excluded from important conversations regarding their medical decisions. Thus, the 7th "P" would ultimately strive to identify vulnerable groups, create inclusive environments that empower these groups to participate in important conversations, and advance ways in which to provide agency and autonomy. Most importantly, the 7th "P" would seek to establish a dynamic in which vulnerable groups can contribute to the quality and efficacy of the research by providing the scientific community with ways in which to understand their own experiences.

Ultimately, the inconclusive nature of *Flowers for Algernon* and *Speed of Dark* is particularly fitting in the sense that, as in any scientific experiment, results are most often inconclusive. And when results are inconclusive, more experiments are needed. Thus, the

unanswered questions of these novels can help us develop future directions for this area of research concerning how readers perceive neurodivergent experience in science fiction. Similarly, the questions these novels do help answer, such as science fiction's role in advancing science, can point us in the right direction. The initial thought for this research was to answer the question: Is it ethical for neurotypical authors to write the experiences of imagined neurodivergent individuals? Yet through my research, I was led to a different question: How do we understand neurodivergence through science fiction, and what do these stories contribute to science? My initial question is an important one, and it is the next question that must be asked. Readers cannot successfully learn from literature if the representations of neurodiverse characters merely fulfill stereotypes. It is particularly important, as it leads us to our next question concerning what research or due diligence must be required of authors who create these imagined, science fiction worlds featuring neurodivergent protagonists and narrators. How do current understandings of disability *need* to be shifted? And finally, how can we improve our learning and understanding of neurodivergent experiences to effectively shift society's view of disability and ultimately improve science and strengthen community?

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