

ENGAGING WITH THE PRESENT BY EXPLORING THE FUTURE:
CRITICAL POTENTIAL OF SCIENCE FICTION IN EDUCATION

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Abstract

In *The Seven Beauties of Science Fiction*, Istvan Csicsery-Ronay Jr. (2008) argues that: “[...] sf has come to be seen as an essential mode of imaging the horizons of possibility” (p. 1). Noting this, I will therefore discuss how SF can be used as a pedagogical tool by educators to help secondary students explore fictional futures, with an emphasis on developing critical thinking skills by comparing science fictional futures and the present. This thesis includes an original in-school study where I use *Parable of the Sower* by Octavia E. Butler, critical theory, genre-based analysis, and inquiry-based learning to encourage students to critically consider contemporary issues. Having analyzed student discussions, introductory questionnaires, exit interviews and written assessments through deductive thematic analysis, discourse analysis and within-method triangulation, I will discuss the practical use of SF to meet critical thinking and critical literacy expectations outlined in *The Ontario Curriculum for English* (2008).

Keywords: Secondary School Education, Curriculum Development, Science Fiction, Critical Thinking, Critical Theory, Literacy

To my mother,
who watched space operas with me those nights I couldn't fall asleep.

To Veronica Hollinger,
who reunited me with science fiction years later.

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Chapter One - Introduction

In this thesis I explore the potential science fiction (SF) has to support secondary school English teachers in meeting explicit expectations outlined in the Ontario curriculum in the areas of critical thinking and critical literacy. This exploration is supported through an in-school study in an Ontario secondary institution. The unconventional structure of this thesis is due to my goal that it be used as a primer for educators interested in using SF to teach students critical thinking skills in English secondary school contexts. As a result, I consider teaching strategies that can assist students in making connections between the futures portrayed in SF texts and their own present experiences, and also provide a detailed extended literature review of SF and critical theory in education. Instead of a linear exploration of study findings following a literature review in key conceptual areas, results from the in-school study are interwoven throughout an exploration of key concepts to provide teachers interested in using SF and critical theory in their classrooms a foundation upon which to develop their own lessons drawing from the resources provided. In this introductory chapter I outline the need for research of this kind in an Ontario context, establish a set of working definitions for science fiction and critical thinking, the two major terms upon which I base my exploration, and discuss the research questions that guided my inquiry.

The primary problem I address centers on students' acquisition of critical thinking skills and teachers' preparedness with regards to teaching those skills in high school English classrooms. To contextualize this problem, the significance of critical thinking in twenty-first century educational contexts must first be established. Educational innovator Salman Khan (2012) begins *The One World School House: Education Reimagined* by identifying the speed at which the world is shifting: "The world is changing at an ever faster rate, yet systemic change, when it happens at all, moves glacially and often in the wrong direction; every day – every class period – the gap grows wider between the way kids are being taught and what they actually need to learn" (p. 2).

Although a writer of largely populist education texts, *The One World Schoolhouse* remains an accessible text about the status of schooling in twenty-first century contexts and a growing need for change in the way students are taught. He acknowledges that the school system most commonly adopted is an outdated one which structurally does not prepare students for life outside of academia. He provides the reader with a brief history of the present school system, and problematizes it due to its initial intent:

To those not in the field, it may come as a surprise to learn that all these then-radical innovations in what we now call K-12 education were first put in place in eighteenth-century Prussia. [...] The idea [with the Prussian model of education] was not to produce independent thinkers, but to churn out loyal and tractable citizens who would learn the value of submitting to the authority of parents, teachers, church, and, ultimately, king. (Khan, 2012, p. 76)

The Prussian model is one which seeks to make students subservient, while critical and democratic education works against these values. In a world which is rapidly changing, students are not being prepared properly for what they will need to know. In contrast, critical thinking as a process can be taught so that students can adapt to situations which are often unforeseen by educators. The importance of this is explicitly acknowledged by Khan, who states that:

The certainty of change, coupled with the complete uncertainty as to the precise nature of the change, has profound and complex implications for our approach to education. [...] Since we can't predict exactly what today's young people will need to know in ten or twenty years, what we teach them is less important than how they learn to teach themselves. (p. 180)

In *One World School House: Education Reimagined*, Khan communicates in an accessible way a complex problem that demands approaches to education shift – unpredictable change requires that students be taught in ways that differ from educational practices of the past. Teaching skills instead of content is the primary objective here. Students who are taught critical thinking skills may learn how to more effectively respond to significant change in meaningful ways that are also inclusive of others, with a focus always on the betterment of their respective societies. While structural change is slow, educators today can adopt critical pedagogical stances and teach students skills which will work against the efforts of archaic modes of education to create critically aware members of democratic society. Through using teaching resources that encourage learners to engage critically, critical thinking skills can be promoted without need for structural change until more progressive models are adopted – in this thesis I propose that SF is a critical teaching resource which can assist in these efforts. Having established a need for resources appropriate for use within current educational paradigms to promote critical thinking skills, this thesis is based on the curriculum currently used in secondary English classrooms in Ontario.

Ontario Contexts

The Ontario Ministry of Education (2007) in *The Ontario Curriculum for English* defines critical thinking as a set of skills that allow students to: “[think] about ideas or situations in order to understand them fully, identify their implications, and/or make a judgment about what is sensible to believe or do” (p. 207). The definition of critical literacy in these documents connects literacy and critical reading practices to the acquisition of critical thinking skills, with the expectation that students will explore various ways of understanding and interrogating knowledge in a variety of forms using critical and creative thinking processes such as “oral discourse, research, critical analysis, critical literacy, metacognition, [and the] creative process” (p. 22). Critical

literacy involves “the ability to identify perspective, values, and issues; detect bias; and read for implicit as well as overt meaning [...and also] involves asking questions and challenging the status quo, and leads students to look at issues of power and justice in society” (p. 34). Critical thinking is also listed as one of the principles underlying the English Curriculum “based on the belief that language learning is critical to responsible and productive citizenship” (p. 4). Although critical thinking is discussed frequently in the front matter of *The Ontario Curriculum for English*, guidance with regards to teaching critical thinking and critical literacy in each course is relegated to only one specific expectation in each of the four strands: oral communication, reading and literature studies, writing, and media studies. Limited information is provided regarding specific teaching strategies and resources or text selection to support the development of critical thought in students, although it is suggested that by “reading a wide range of materials and being challenged by what they read, students [will] become receptive to new and widely varying ideas and perspectives, and develop their ability to think independently and critically” (p. 5). The problem I explore in this thesis is therefore firmly rooted in evidence that suggests *The Ontario Curriculum for English* provides educators with insufficient guidelines for how to teach critical thinking and critical literacy directly.

In particular, I explore how the selection of specific texts and the use of resources which promote critical thinking and critical literacy skills directly can support teachers in meeting learning expectations in ways that engage students in authentic learning and critical considerations of contemporary issues. *The Ontario Curriculum for English* does not place limitations on the texts which can be used to meet overall and specific expectations, making text selection a useful place to begin exploring opportunities for growth in teaching critical thinking skills. The primary questions in this project address what resources and approaches are available for teachers to

incorporate critical thinking practices into their classrooms, how the selection of SF texts can assist in teaching critical thinking and critical literacy skills, and the impact using SF to meet critical thinking goals in high school English classrooms has on student learning and experience. The remainder of this introduction clarify concepts which informed the development of an in-school study discussed in the following chapter.

Science Fiction

Because I am making the claim that SF as a genre lends itself to critical considerations of its subject matter through its inherent structure, here I will provide a working definition to assist the reader in understanding how I am using the term ‘science fiction’ and its structural components. Early on in his *Critical Theory and Science Fiction*, Carl Freedman (2000) says of SF that “No definitional consensus exists” (p. 13). The problem with defining SF is one which countless SF theorists have tackled and, as Freedman suggests, no consensus has been reached. In his article “Theorizing Science Fiction: The Question of Terminology”, Gary K. Wolfe (2011) even suggests this definitional ambiguity be used as a starting point for the teaching of SF as a genre:

Beginning such a class by surveying the students’ various notions of what they think it is that they will be reading can be a useful and often enlightening exercise, both by way of introducing a discussion of problems of definition and as preparation for the students’ later encounters, in their own research, with the sometimes idiosyncratic critical vocabulary that has evolved in science fiction scholarship. (p. 39)

While a universal definition of SF is continually sought after, it is this openness to interpretation which contributes in part to the critical potential SF has as a genre to be taught. When interrogating genre directly, students may use any number of SF texts to directly consider what they believe SF is. However, for the purposes of text selection for this project, it is Farah Mendelsohn’s approach to defining SF which I most closely adhere to. In the first chapter of her study on children’s and

teens' SF titled *The Intergalactic Playground*, Mendelsohn (2009) first establishes a definition of SF summarized as:

DISSONANCE, RUPTURE, RESOLUTION, CONSEQUENCE. [sic] [...] What I have termed DISSONANCE [sic] is constructed by the novum and the element of cognitive estrangement. The novum is the idea or object that creates the rupture within the world as we understand it. (p. 10)

Here Mendelsohn is drawing from the work of Darko Suvin, who establishes both the novum and cognitive estrangement as key elements to the SF work. In his article “Estrangement and Cognition,” Suvin (1979) states that, “Sf is, then, a literary genre whose necessary and sufficient conditions are the presence and interaction of estrangement and cognition, and whose main formal device is an imaginative framework alternative to the author’s empirical environment” (p. 27). Estrangement occurs for Suvin in SF texts because of the novum which makes the world presented in the SF text different from that of the reader’s. For example, in M.T. Anderson’s *Feed* (2002), the novum is an internet connection implanted in the brain which provides individuals with constant access to shopping and social media. The novel follows a group of teens who are attacked by a virus while on a trip to the moon, and subsequently explores what happens when the feed stops working and shuts down the brain. The feed is therefore the novum – the central shift in the novel that makes the science fictional future different from our own. Closely linked to the concept of the novum and estrangement is cognition, which for Suvin means that the text is concerned with the rationality underlying those differences between the fictional world and that of the reader. *Feed* remains a useful example for illustrating how Suvin uses cognitive estrangement to describe how SF texts operate. Given the parallels between social media use in the novel and that which most readers experience in the present (alongside other similarities between the present and the depicted

future such as commercial takeover of daily experience and limited access to medical care without insurance in the United States), the text is structured in such a way as to invite critical comparisons through the exploration of differences and similarities between the present and the envisioned future. The emphasis Darko Suvin places on cognitive estrangement is echoed in many explorations of how SF texts function. For example, Freedman (2000) uses Suvin's work on cognitive estrangement to limit his focus when discussing SF as a genre, stating that "[...] in more routine usage, the term science fiction ought, as I have maintained above, to be reserved for those texts in which cognitive estrangement is not only present but dominant" (p. 22). Although Freedman's definition of SF naturally excludes many texts where the dialectic between cognition and estrangement is not at the forefront of the text's intent, I have taken a similar approach for the purposes of my focus on SF as a critical literature. Establishing the importance cognitive estrangement in my definition of SF, Mendelsohn's continuation of this line of thought becomes significant as well. Of SF she states:

[...] in the "full sf story," the resolution is not the end of the story, it is the beginning, for sf resolutions are about *change* and *consequence*. [...] Identification of novum and cognitive dissonance usually leads to the idea of causality and consequence; that "what if?" needs to be followed by the concept of "if, then." (Mendelsohn, 2009, pp. 12-13)

For Mendelsohn, the purpose of Suvin's cognitive estrangement, which Freedman also identifies as a key aspect of SF, leads the reader towards extrapolative work. The understanding that there are consequences for decisions and action is central to the work that the novum does in SF for Mendelsohn, as it illustrates that an alteration of the reader's world will directly impact both the reader and society in a plethora of ways. This emphasis on change is at the root of Mendelsohn's

understanding of SF, and it is this which also plays a key role in my own working definition of the genre as a critical and pedagogical tool to teach critical thinking.

Critical Thinking

Establishing SF as a genre which inherently favours critical thinking through both form and content, critical thinking must also be defined so that my intentions for this project can be fully understood. My theoretical understanding of critical thinking primarily comes from Stephen D. Brookfield's *Developing Critical Thinkers: Challenging Adults to Explore Alternative Ways of Thinking and Acting* (1987). While this text is focused on adults, many of the principles which Brookfield outlines can be applied to the high school classroom with the intent of preparing students to consider the world which they will engage with both intellectually and in everyday life.

Brookfield makes the claim that being “a critical thinker is part of what it means to be a developing person, and fostering critical thinking is crucial to creating and maintaining a healthy democracy” (p. 1). Critical thinking is a fundamental characteristic of an active member of society who will engage in interrogating institutional powers. Brookfield first addresses commonly held assumptions regarding critical thinking, namely its incorrect labeling as a negative activity. He states that “Critical thinking is a productive and positive activity, as critical thinkers see the future as open and malleable, not as closed and fixed. They are self-confident about their potential for changing aspects of their worlds, both as individuals and through collective action” (p. 5). The connection between critical thinking and SF is never one which Brookfield makes, but this statement echoes the positive belief in change that ultimately resides at the heart of many SF texts. Critical thinking allows the individual to see that a better world is possible or a world worse than ours avoidable, and can also allow students to conceive of ways in which that change can be realized.

While critical thinking is commonly viewed as the means towards a goal of understanding a specific situation, Brookfield suggests that “Critical thinking is a process, not an outcome. Being critical thinkers entails a continual questioning of assumptions. People can never be in a state of complete critical development” (p. 6). To be a critical thinker is not only to engage in a process of constantly being aware of assumptions, but also to acknowledge that there is never a moment when one should cease being critically aware of alternatives. Brookfield summarizes the process of critical thinking as consisting of two main activities: “[...] (1) identifying and challenging assumptions and (2) exploring and imagining alternatives” (p. 15). At the heart of critical thinking, and similarly at the core of SF, is the importance of acknowledging assumptions, challenging the status quo, and imagining a better world.

Although Brookfield establishes that critical thinking is of particular importance for maintaining a functional and productive democracy, he also outlines issues connected to that development:

Making the attitudinal shift to reinterpret as culturally induced what were initially held to be personally devised value systems, beliefs, and moral codes can be highly intimidating. [...] Identifying the culturally produced assumptions underlying our “common-sense” ideas is sometimes liberating, but it can also make us feel that we are entirely the product of social forces. (p. 17)

In a world which increasingly becomes more competitive and marginalizing, Brookfield emphasizes the importance of facilitators, in this instance educators, who lead students of critical thinking to the emancipatory qualities of critical interrogation. He says of this issue:

When the world is perceived as fundamentally uncontrollable, and when major events in our lives are viewed as unpredictable and inexplicable, we feel powerless.

Individuals trying to make themselves into critical thinkers or hoping to encourage this capacity in others are trying to replace this sense of powerlessness with the conviction that the world is not governed completely by accidental happenings beyond our understanding. (p. 56)

Teachers who want to focus on critical thinking must support their students, outlining the liberating potential it has to help the individual to see clearly underlying assumptions which act upon social convention and political ideology. While initially daunting, Brookfield clearly outlines the importance of fostering critical thinking skills in students so that they will no longer feel powerless. What emerges in a student who has adopted a critical perspective is, Brookfield summarizes, “A readiness to ask why things are the way they are, a capacity to speculate imaginatively on alternative possibilities, [and] an inbuilt skepticism of the pronouncements and actions of those who are judged to be in positions of political and economic power” (p. 68). Teaching critical thinking skills involves embracing these actions in students, and encouraging students to continually question preconceived notions of belief and action.

This understanding of critical thinking as an emancipatory tool exposes the importance of this study, as SF is used to introduce students to tools of the genre (‘SF literary devices’ in this thesis), as means to engage with contemporary issues through literature. Given the growing importance of critical thinking in an increasingly complex and interconnected world, teachers need additional resources to meet their students’ learning needs in secondary classrooms. While the use of SF is emphasized in this study, critical theory is also used to support students’ exploration of SF texts as a way to support learning.

Critical theory. A definition of critical theory (hereafter CT) is required to explore how theoretical approaches to reading offer effective teaching strategies for SF. Carl Freedman’s

Critical Theory and Science Fiction (2000) is fundamental in my understanding of the connection between SF and CT, whereby:

Critical theory, to use a currently fashionable term, is unswervingly oppositional.

[...] Critical theory is dialectical thought: that is, thought which (in principle) can take nothing less than the totality of the human world or social field for its object.

[...] critical theory constantly shows that things are not what they seem to be and that things need not eternally be as they are. Thus it maintains a cutting edge of social subversion even at its most rarefied and abstract. (p. 8)

Freedman goes on to state that his aim is “not to read science fiction “in the light of” critical theory [...] but to articulate certain *structural* affinities between the two terms. [...] to show that the conjunction of critical theory and science fiction is not fortuitous but fundamental” (p. 23). He comes to this conclusion through Darko Suvin’s concept of cognitive estrangement – when the reader interacts with the SF text they are pushing themselves towards understanding, and comparing the differences presented in the text with the empirical world with which they are familiar. For Freedman then, CT and SF are linked in part because they both seek to destabilize assumed and overarching truths through questioning. It is in the comparison of the present with the science fictional future that this questioning takes place: “The future is crucial to science fiction not as a specific chronological register, but as a locus of radical alterity to the mundane status quo, which is thus estranged and historicized as the concrete past of potential future” (p. 55). Carl Freedman is not the only SF scholar to suggest the link between SF and CT as one of emphasized alterity, as P.L. Thomas (2013) in *Science Fiction and Speculative Fiction: Challenging Genres* similarly argues:

A central quality of SF and speculative fiction (fantasy and historical fiction as well) that is significant is that the creation of some form of another world helps frame for the readers this world. Whether the other world is conjured by a shift in time or reality, the other world becomes both a commentary on this world and a possibility of other ways of being (again, a powerful and critical element in SF). (p. 193)

Using SF to understand this world can be further supported by the use of CT, where futures can be explored through specific lenses or ways of seeing. The application of CT on SF texts can assist readers in learning from the inherently critical nature of science fictional futures.

An example of the way CT can support students' interactions with SF texts can be seen in the pairing of Becky Chambers' *The Long Way to a Small Angry Planet* (2014) to feminist literary criticism and queer theory. In this novel Earth has been abandoned due to environmental devastation and a universal government called the Galactic Commons has been formed, uniting multiple sentient races. Instead of there being one primary character, Chambers divides the novel up into chapters told from the perspectives of all the ship's crew. This supports a wide range of perspectives, not only the dominant male voices so common in the space opera subgenre. While Chambers' text is less connected to present contexts and consequences because of it taking place in the distant future, respectful interactions with otherness and difference are modeled in this novel through the relationships between characters across lines of species, race, and gender, and characters continually negotiate the terms of various sexual and gendered identities. Instead of showing inter-species interactions and relationships as either fully peaceful or entirely chaotic and violent, Chambers uses and transforms the science fictional trope of the 'alien' to show that living and interacting with difference takes a commitment to openness and learning, alongside the

acceptance of uncertainty. Feminist literary criticism and queer theory can be used to explore the institutional systems operating within the future in Chambers' novel and the interactions between characters and species along lines of sexuality and gender. Explored in a high school English classroom, a text such as this can be used to comment on differences and similarities between the text and the present, as peaceful coexistence is not just an end goal but a process of continual growth. CT can be used by teachers alongside teaching strategies listed in *The Ontario Curriculum for English* (oral discourse, research, critical analysis, critical literacy, metacognition, [and the] creative process) to support students' explorations of SF texts that are structurally designed to invite critique, comparison and questioning. In addition, contemporary young adult SF is not only popular but the quality of YASF is also notable – texts such as Cory Doctorow's *Little Brother* (2008) and *The Hunger Games* series by Suzanne Collins (2008) are popular works that can also help students learn to think critically.

Use of terms: Critical theory, literary theory, critical literacy, and critical thinking.

In order to ensure that the argument I make regarding the use of CT in supporting students' reading of SF texts and their development of critical thinking skills is clear, in this sub-section I will discuss how I am using the following terms in this project beyond the condensed definitions already provided: critical literacy, critical theory, literary theory, and critical thinking. I will use the term 'critical literacy' to broadly situate how I discuss student engagement with a wide range of SF and non-SF texts. I will also discuss my use of the word 'critical,' a central term used throughout this thesis. I will then explore the relationship between critical thinking and critical theory, and will clarify my interchangeable use of critical theory and literary theory. Finally, I will note limitations in my use of the term 'critical theory' and opportunities to expand on this area of work in relation to SF outside of the scope of this current project.

Expanding on the concept of critical literacy outlined in *The Ontario Curriculum for English* (2008), Jonathan Culler's description of the 'theory' aspect of literary theory in *A Very Short Introduction to Literary Theory* (2000) partially embodies my use of 'critical literacy':

Theory is often a pugnacious critique of common-sense notions, and further, an attempt to show that what we take for granted as 'common sense' is in fact a historical construction, a particular theory that has come to seem so natural to us that we don't even see it as a theory. As a critique of common sense and exploration of alternative conceptions, theory involves a questioning of the most basic premises or assumptions of literary study, the unsettling of anything that might have been taken for granted: What is meaning? What is an author? What is it to read? What is the 'I' or subject who writes, reads, or acts? How do texts relate to the circumstances in which they are produced? (pp. 4-5)

To engage in critical literacy is to explore a text beyond surface-level analysis. Although critical literacy is not a term I use frequently within this project, my use of critical theory and literary theory approaches in facilitating students' reading experiences, and my emphasis on developing critical thinking skills is closely linked to my conception of critical literacy. To be critically literate is to not only understand the text, but to understand that reading is a reciprocal relationship; society impacts what is written in countless ways and in turn cultural products, such as science fiction stories, impact society through the reader. In the context of the English classroom and in this study, critical literacy and critical thinking are overlapping and inextricably linked concepts.

The word 'critical' is a significant aspect of my approach in this research, and therefore requires definition as well so as to clarify my use of numerous terms labeled as 'critical.' Tim Dant in *Critical Social Theory: Culture, Society and Critique* (2004) provides a detailed exploration of

the term in the context of early critical theorists and the importance of critique in the development of critical theory. His consideration of the word 'critical', taken from the process of critique, is based on Theodor W. Adorno's work within critical theory as part of the Frankfurt School. Dant cites the importance Adorno places on critique as a way to maintain democratic processes, as critique enables resistance and allows individuals to consistently question what might otherwise be accepted passively (2004, p. 6-7). Dant describes the process of critique, or being 'critical,' which involves first reflecting on and establishing one's own position or opinion, justifying those opinions, and being willing to articulate one's position on issues in ways that allow for dialogue. This is necessarily a reflective process that causes individuals to engage not only in detailed analysis, but also facilitates consideration of broader concerns:

Critique begins to challenge whole systems rather than identify failings. A critique of society confronts the form of society as a whole, perhaps identifying particular features but treating them as consequent upon the underlying character of the social system. (Dant, 2004, p 7).

Engaging in critique therefore involves questioning structures and systems of power in a given society, speculating the underlying cause, and considering how circumstances can be improved. The concept of critique, or being 'critical,' is therefore significant to this project. When I use the term 'critical,' I am referring specifically to opportunities for questioning and reflection embedded in student experiences engaging with SF texts. Critical literacy, critical theory, and critical thinking therefore all serve as frameworks to conceptualize the experience of 'critique' that students have within this study. Critical literacy refers to approaches which encourage students to question the constructedness of texts and their reading experience, including the role literacy and reading plays in cultural and societal development. I use critical theory to refer to the broader objectives affiliated

with critical engagement with contemporary issues and texts, including speculating how things could improve based on identified problems (i.e. the inequitable distribution of power and resources). Critical thinking broadly refers to a set of skills or methods which aid in students' ability to communicate their position and engage in productive dialogue, with the potential of social awareness and action.

In *Critical Theory* (2003), Alan How makes a distinction between 'Critical Theory' and 'critical theory,' with the latter equated largely with literary theory. While How uses the former capitalized term, in this project I often use critical theory interchangeably with literary theory. However, in spite of the conflation of the terms critical theory and literary theory within this thesis, How's argument as to why critical theory remains a relevant practice today reinforces my choice to draw from the broader philosophical process of critical theory instead of only discussing literary theory specifically. He states,

Critical Theory in the hands of both earlier and later generations is relevant to an understanding of the present, and [if] we allow it to speak to us it will open up rich avenues of thought. [...] if the aim of education is to show students something of how the world really works, then [Critical Theory's] claims are as relevant as ever.
(2003, p. 171)

While various literary theories provide the how with which I encouraged students to engage with contemporary issues in relationship to SF texts, critical theory as a concept provides the why. With an emphasis on power structures and a push against reification, critical theory highlights the constructed nature of ideas and systems of power in place, allowing students to resist accepting things the way they are and, by extension, resist the dystopian futures depicted in SF texts that are inspired by the author's concerns about their own present moment. Of critical theory, How argues,

“[without] a sense of having come from somewhere there is no sense that the world might move on somewhere else. Critical Theory hangs on to the possibility that things could be different” (2003, p. 173). Within the context of this study, critical theory as a broader conceptual framework and literary theories as conceptual tools provide students with an opportunity to see their present reality in new and clarifying ways, thereby making the comparison between their present and science fictional futures an authentic learning opportunity.

Within this study I use critical theory as a philosophical framework alongside distinct literary theory approaches to support students’ exploration of SF texts, while simultaneously assisting students in developing critical thinking skills and habits. Given the claim I make that, due to the temporal relationship between the present and science fictional futures, SF is particularly suited to helping students develop critical thinking skills, critical theory helps frame these efforts as empowering and emancipatory for students. Tim Dant notes goals of critical theory which makes the conceptual framework useful in guiding student learning:

Critical theory does not seek objective distance but aims to be adopted as a mode of knowledge and action by all human beings so that their decisions shape their history, rather than their actions following mechanically those of a system. Struggle and change are components of the critical attitude as much as a critique of the existing order. (2004, p. 136)

Throughout this study, students were asked to use essential questions they were given, analytical skills they were taught, and their own original questions and concerns to speculate how things could be different or better than they currently are, and to consider how dystopian futures could be avoided. Significantly, students were asked to compare science fictional futures with the present once they had already established an understanding regarding how SF futures are not merely

fictional, but rather inspired by reality. While I did not engage with the concept of language central to the development of critical theory in this study, the way Raymond Geuss in *The Idea of Critical Theory: Habermas and the Frankfurt School* (1981) describes the objectives at the heart of critical theory resembles my goals for students as they become critical thinkers:

Critical theories aim at emancipation and enlightenment, at making agents aware of hidden coercion, thereby freeing them from that coercion and putting them in a position to determine where their true interests lie. [...] Critical theories [...] are claimed to be ‘reflective,’ or ‘self-referential’: a critical theory is itself always a part of the object-domain which it describes; critical theories are always in part about themselves. (p. 55)

Stephen Brookfield’s description of critical thinking is similar in many ways to Geuss’s treatment of critical theory; both authors claim there is a possibility of enlightenment and empowerment in critical engagement and thought, and that an awareness of and reflection on how critical thinking impacts their own experience of learning and being in the world is itself an emancipatory process.

Research Questions

In this project I propose that the use of CT and SF together offers teachers effective approaches to teaching critical thinking skills. Many secondary level teachers are hesitant to incorporate critical and literary theory into their instruction, but the benefits of such practice with regards to giving students critical lenses through which to view and change their world has been established (Appleman, 2009; 2015). The purpose of this project is to answer the following questions: (a) What expectations in the areas of critical thinking and critical literacy are outlined in *The Ontario Curriculum for English*; (b) How might the joint use of CT and SF assist teachers in meeting these expectations in high school English classrooms; and (c) How does the use of SF and related reading strategies impact students’ learning experiences? Noting the uncertainty with

which many educators approach critical and literary theory, research that draws parallels between SF and CT provides a framework for engaging with this problem (Freedman, 2000). Together, SF and CT provide new strategies for teaching skills central to literacy and language arts learning in contemporary classrooms. I conducted this research in the context of two broader academic discussions at the intersections of both SF and CT and SF and education.

Chapter Summaries

Following this introduction, in chapter two “**Science Fiction and Critical Thinking: An In-School Study**” I discuss the in-school study conducted at a Toronto high school, the results of which are interwoven throughout this thesis. I establish connections between the study content and the curriculum, discuss the texts used in this study, my research methodology, and the various forms of assessments students engaged in throughout the unit.

Literature reviews under the umbrellas of the two main concepts of this thesis are explored in chapter three and four, on SF and CT respectively. Chapter three, “**Science Fiction Concepts & Pedagogies: Putting SF to Work in the Classroom**” contains a history of scholarly work done at the intersection of SF and education in the context of the genre’s fraught relationship with the literary canon and the academy. Having established gaps in scholarship in this area, in the remainder of the chapter I discuss how I adapted SF concepts and structural elements to meet the needs of secondary school learners, including a detailed exploration of the follow SF terms and student responses: novums, cognitive estrangement, extrapolation, world building, the absent paradigm and science fictionality.

Chapter four, “**Critical Theory: Frameworks for Envisioning the Future**” involves a similar exploration into CT and its use in secondary school education. In this chapter I make connections between CT and critical thinking, and emphasis is placed on skill development and

the resources I used to support the study inquiry through literary theory. Finally, I discuss the CT lenses I used to guide students through critical engagement with various SF texts, including feminist literary criticism, Marxist literary criticism, post-colonialism, biographical criticism, historicism and new-historicism. The chapter ends with the exploration of a discussion-based approach to teaching CT.

Chapter five, **“Teaching at the Intersection of SF and Critical Theory”** involves an exploration of work on teaching CT through SF, after which I discuss how I balanced both concepts during the teaching portion of this study. In particular, I make suggestions on how to use SF and CT as vehicles to support student inquiry, and provide examples of how I facilitated student engagement with SF texts.

In the final chapter **“Beyond Orwell, Huxley, and Bradbury: Critical Uses for SF in Contemporary Classrooms”** I will discuss in more depth the findings of the in-school study I conducted for this thesis in the following conceptual areas: SF, CT, and critical thinking and contemporary connections. The suggestions made in this chapter will be the result of data gathered in the following ways: an initial questionnaire at the beginning of the study, field notes and student contributions during in-class discussions, an exit interview, and a final written assessment. It is in this chapter that I will explore student response to SF and CT, and make suggestions for best practice.

Conclusion

Given the increasing rate at which change occurs with the advent of scientific and technological innovation, SF is particularly suited to helping students make sense of, interrogate, and enact change within the reality of their own contemporary contexts. It is my hope that this thesis contributes to broader conversations regarding much-needed changes in the way students

are taught, with a shift towards skill-based learning and a fostering of inquiry and curiosity in students in secondary English classrooms. Through this project I also hope to provide educators with resources to support their teaching of critical thinking, rooted in findings that suggest SF can help educators connect students with ways of thinking that will assist them both in and beyond the classroom.

Chapter Two - Science Fiction and Critical Thinking: An In-school Study

This thesis is supported by an extended literature review in the areas of science fiction (SF) scholarship, educational research, critical theory (CT) and critical thinking in chapters 3 and 4, but a majority of suggestions I make throughout this thesis are the results of findings from an original in-school study I conducted in a Toronto high school in October of 2016 which I interweave throughout the following chapters. I created an original unit for this study based on my own longstanding interest in the pedagogical uses of SF and my own experiences as a reader of the genre, and also drew from research regarding existing educational resources in SF, CT and critical thinking. My role as a teacher-researcher was significant in designing this unit, as I am not only interested in exploring the benefit of SF and CT to assist students in developing critical thinking skills, but as a teacher I have also identified a need for more inclusive and critically-oriented English resources that help educators move beyond largely white, male voices of privilege in literature. As a genre in which authors often envision alterity and explore potential futures through increasingly diverse characters, I use SF in this study not only as a tool to activate students' critical thinking skills, but also as opportunity to move beyond the literary canon in secondary school contexts. This unit was implemented in two grade 12 university level English classrooms with the primary objective being to teach critical thinking learning expectations outlined in *The Ontario Curriculum for English* through SF and CT. The in-school portion of this study was dedicated to answering the following question: How does the use of SF and related reading strategies impact students' learning experiences? This question is answered in this thesis through the analysis of the results of a study involving the direct use of developed resources in two English classrooms.

A third grade nine locally developed compulsory credit (LDCC) English class participated in this study, where my goal was to introduce students to SF as both a genre and as a way of

thinking critically about the relationship between the present and fictional futures. Given the structure of LDCC classes, an additional emphasis was placed on exploring how genre-specific characteristics of SF might support students' development of foundational literacy skills in reading and writing. However, the grade 9 portion of the study is not discussed in this thesis due to limited data collection and a reduced curriculum. My original objective in working with both grade levels was an interest in comparing the experiences of both age groups, but this portion of the study did not yield enough data to make an informed comparison. Therefore, although three classes participated in this study, in this chapter I will discuss the research methods I used in developing and implementing a unit on SF for the two participating grade 12 classes, and will also expand upon my approach to data collection and analysis. Findings from these two classes will be interwoven throughout the rest of the thesis and will be used to support the conceptual exploration of key concepts and pedagogical suggestions for best practice.

Methodology

In this study I employed a generic qualitative research approach (Kahlke, 2014; Merriam, 2009) with a focus on my role as teacher-researcher (Andrelchik, 2016; Banegas, 2012). I gathered data through an initial questionnaire, field notes on my observations during teaching and discussion contributions by students, a written assessment, and individual interviews with students at the end of the study. For the in-school portion of my research I assumed the role of teacher-researcher, developing and teaching an original unit on SF in conjunction with Ontario curriculum expectations and pre-existing literacy goals in the areas of reading, writing, oral communication and media studies in consultation with the participating teacher (see appendix A for curriculum-specific literacy goals in the form of a unit plan). My objective in this study was to understand the expectations placed on teachers in the Ontario curriculum with regards to critical thinking skills,

to explore the potential benefits of SF and CT to meet specified learning goals in this area, and to assess student experience regarding the use of SF to meet critical thinking learning expectations. The goal of this thesis is to develop approaches to teaching critical thinking in secondary English classrooms that can assist educators in providing students with the critical thinking skills needed to succeed in a variety of contemporary contexts. The following sections describe the in-school portion of my research in more detail, the results of which support further explorations throughout the thesis.

Research participants and setting. This study was conducted at a public high school in a large school district in Ontario. I conducted this research over the span of three weeks in two grade 12 university level English classes with a total of 52 participants. For this unit students read Octavia Butler's *Parable of the Sower* as a month long novel study, supported by a reading of Paulo Bacigalupi's short story "The People of Sand and Slag". The first week of the novel study was conducted by the classroom teacher, and did not involve any genre-based inquiry¹. While the initial intent was for the study to cover the entirety of the novel, due to delayed school board approval the classroom teacher had to begin the novel with the classes. Given her lack of experience with SF and CT, students' exposure to related concepts was therefore also left until the study began. However, all teaching resources were developed in consultation with students' regular classroom teacher, including the written assessment of learning at the end of the unit (described in more detail on page 23).

Data gathering. This study involved the use of multiple methods for gathering data, including: an initial questionnaire establishing students' previous experiences with and opinions

¹ This was not an intended structural element of the study, but was the result of delays in ethics approval with the participating school board.

on SF (see appendix B), observations during the teaching process in the form of field notes, the results of a written academic assessment (see appendix for assessment C), and a brief interview with the participants in which they discussed their experiences throughout the study regarding learning critical thinking skills through SF and CT (see appendix for interview questions D). I analyzed the data using deductive thematic analysis (Smeyers, 2008; Yukhymenko, Brown, Lawless, Brodowinska, Mullin, 2014) which assisted me in identifying patterns in students' questionnaire responses, my own field notes, students' written assessments and individual interviews in the context of research at the intersection of CT, SF and education where students were asked questions involving their impression of SF as a critical tool, how they might use science fictional thinking when problem solving, and if their understanding of SF had changed in any way in comparison with their questionnaire responses at the beginning of the study. Discourse analysis has assisted me in processing data gathered through student discussions recorded in my post-teaching field notes and students' final written assessment (Jørgensen & Phillips, 2002). I also used within-method triangulation through questionnaires, in-class discussions, a written assessment and individual interviews to cross-reference student responses and further identifying reoccurring themes or opinions, allowing me to more effectively track student experience throughout the study (Blaxter, Hughes & Tight, 2006; deMarrais & Lapan, 2004; Huettman, 1993).

Curriculum Development

This study was designed using principles of CT and inquiry-based learning (Chiarotto, 2011; Kuhlthau, Maniotes & Caspari, 2007; Levy, Thomas, Drago & Rex, 2013), with the goal of facilitating opportunities for students to engage in “open-ended investigations into a question or a problem, requiring them to engage in evidence-based reasoning and creative problem-solving, as well as ‘problem finding,’” and emphasis was placed on “moving students beyond initial curiosity

to a path of regular inquiry” (Ontario Ministry of Education, 2013, p. 2). While CT was used to support students’ entry into the SF texts explored, adopting an inquiry-based approach to learning allowed for students to use the ‘big ideas’ of SF and CT to explore aspects of the texts that resonated with them, their own concerns, and their own lived experiences. This was a useful framework through which to develop the in-school portion of this project because inquiry-based learning is founded on the belief that inquiry, and by extension critical thinking, is most fruitful when done in pursuit of answers to questions students are genuinely dedicated to investigating. In this way, the unit was designed to provide as flexible a learning experience as possible for students within the parameters of the two ‘big ideas’ of the unit, SF and CT (see chapters 3 and 4 for further discussion).

Text selection. Text selection was a significant part of the development of this study, as students were given multiple opportunities to engage with various texts to scaffold their learning and individual explorations. Students read Octavia Butler’s *Parable of the Sower* (1993) and used the concepts of world building and extrapolation to consider SF as a tool for critical thinking and political or social critique. *Parable of the Sower* tells the story of a near-future California devastated by political, environmental and economic turmoil. Told through journal entries by a 15-year-old girl named Lauren who lives in a walled community struggling to survive amidst water shortage and rampant violence, the reader is given a first-person account of a dystopian world that has clear connections to the reader’s contemporaneous society as the narrator frequently reflects upon what lead to her circumstances. I chose this text for a number of reasons. First, it meets the requirements for a strong SF text as outlined in the introduction of this thesis – the text contains all elements of an ‘SF story’ as described by Farah Mendelsohn in *The Intergalactic Playground* (2009). Although not published as YASF, this text not only meets specific criteria for a strong SF

story, but also has a young, black, female protagonist. Second, this text does not contain any of the stereotypical tropes which characterize SF, allowing for an opportunity to expand students' understanding of what SF looks like. Beyond this text's ability to deepen students' exploration of SF as a genre, Octavia Butler in *Parable of the Sower* also explicitly considers the inevitability of change and the connectedness of humanity, thus facilitating an opportunity to complicate readers' understanding of society as a dynamic entity. Finally, this text has clear connections to contemporary issues that can be easily accessed through a variety of CT lenses.

Paolo Bacigalupi's short story "The People of Sand and Slag" (2004) was used to support students' learning of SF 'literary devices' and structural elements. The story takes place in the distant future and focuses on the experiences of three technologically enhanced humans who find a dog in the mining pits of an environmentally devastated America. This short story clearly illustrates elements of SF for students to identify, and provides students with another highly varied example of what SF 'looks like'. Pairing a short story with the novel allowed students opportunities to practice thinking about SF as a genre and as a way of understanding a text.

The unit has three clear conceptual moves – SF and SF concepts, CT, and combining aspects of both as an effort to support critical thinking. In order to teach students various CT lenses, I used slam poetry on topics related to the approaches discussed, including poems on gendered violence, the impacts of colonialism on individuals' sense of self, racial profiling, and personal history, which will be discussed in more detail in chapter 4. The primary objective of drawing from a variety of texts came from an identified need for students to have opportunities to practice applying concepts. Finally, the documentary *Watermark* by Jennifer Baichwal and Edward Burtynsky (2013) was used to provide students with an opportunity to practice applying the SF concept of extrapolation to a contemporary issue – students were asked to compare the

documentary with the novel *Parable of the Sower*, and to consider how both are part of a broader conversation regarding water shortage and the inequitable distribution of resources. Students' engagement with these texts was directly connected to expectations outlined in their final written assessment.

Assessment. The written assessment involved students writing a comparative 2-page essay, with an emphasis on cognitive estrangement and extrapolation as critical thinking strategies. Students were also asked to use a CT approach of their choosing to articulate the differences and/or similarities between the science fictional future presented in *Parable of the Sower* and a contemporary event or phenomenon. In this piece, students were asked to identify how the SF text's future compares to the present through an independently selected theme (i.e. environmental impact, politics, gender relations), how they make sense of this comparison using CT and SF concepts such as the novum and extrapolation, and how *Parable of the Sower* and other SF texts might help them critically explore contemporary contexts. The following are instructions from the assignment sheet provided to students a week into the three-week study:

You will write a 2-page opinion piece linking an issue from the novel you read (examples: environmental issues, climate change, class and economic issues, race and violence, terrorism and surveillance, technology, media and power) to a contemporary issue or event. You will then use SF literary devices and critical theory approaches discussed to consider how the SF novel you read might help readers critically interrogate the world in which we live. The issue from the SF future in *Parable of the Sower* and the contemporary issue or event you choose to explore is entirely up to you – the important thing is that you use SF and critical

theory to consider new critical perspectives in an area of interest! (see appendix for full assignment sheet and rubric)

The assignment assessed students' abilities to use various text forms and approaches to process information leading to a critical questioning and examination of their own lives or contemporary phenomena. At the request of the classroom teacher, students were given an exemplar of this assignment based on Bacigalupi's "The People of Sand and Slag" (see appendix E). The primary objective with this assignment was to provide students with an opportunity to use CT in conversation with Butler's *Parable of the Sower* to consider issues present in their own lives or that they have observed in the world either through personal experience, the media, or independent research. In engaging in this type of work, my goal was for students to see SF as a critical tool through which they could explore real contemporary issues and imagine possible alternatives.

Conclusion

I designed the original in-school study discussed in this chapter based on genre-specific explorations of SF, the use of SF in education, and CT as a teaching tool. Having conducted an extended literature review in these areas in preparation for developing the pedagogical resources used in this study, much of this thesis acts as a primer for teachers interested in teaching at the intersection of SF and CT. The results of the adjoining in-school study are therefore positioned in conversation with these conceptual explorations, as significant terms crucial in teaching SF and CT are discussed in-depth alongside student experience and feedback which guide my suggestions for educators. Rather than systematically discussing my findings, I have interwoven student response and my own observations within broader conceptual considerations. Given the limited contemporary research on the use of SF in secondary schools, communicating my results in this

way furthers my goal for this thesis to be used as a primer for teachers as parts of my work can be adapted to meet the unique needs of educators using SF for a variety of purposes beyond the scope of this study.

Chapter Three - Science Fiction Concepts & Pedagogies: Putting SF to Work in the Classroom

The once-regnant view that sf can't help but be vulgar and artistically shallow is fading. As the world undergoes daily transformations via the development of technoscience in every imaginable aspect of life, [...] sf has come to be seen as an essential mode of imaging the horizons of possibility. However much sf texts vary in artistic quality, intellectual sophistication, and their capacity to give pleasure, they share a mass social energy, a desire to imagine a collective future for the human species and the world. (Csicsery-Ronay Jr., 2008, p. 1)

In his *The Seven Beauties of Science Fiction*, Istvan Csicsery-Ronay Jr. (2008) notes the important position science fiction (SF) holds in both society and scholarship as a vehicle for understanding and anticipating change in transient contemporary contexts. He identifies the reach of SF as extending beyond science fiction scholarship, noting that “[at] this moment, a strikingly high proportion of films, commercial art, popular music, video and computer games, and nongenre fiction are overtly sf or contain elements of it” (p. 2). Throughout *The Seven Beauties of Science Fiction* a theme is consistently returned to – that SF has transcended mere genre and has become a way of thinking about the present beyond those who consider themselves part of the SF community. Although the widespread popularity of SF is a fairly recent phenomenon, the observation that SF as a genre is uniquely tuned in to the contemporaneous moment of authors as they envision potential futures is not an uncommon view within SF scholarship. Roger Luckhurst (2005) in his history of the genre titled *Science Fiction* notes the longstanding relationship between SF and efforts at understanding contemporary contexts:

SF is typically regarded as a very low literary form, often completely ignored or edged to the margin of literary study or intellectual history as rather juvenile. Cultural history, however, tries not to prejudge its evidence, and thus finds itself open to the immensely rich resources that a genre like SF offers to anyone interested in key aspects of the culture and history of the West in the last 120 years. Viewed in this way, the genre offers its own kind of surrogate public history. (p. 2)

While both Luckhurst and Csicsery-Ronay Jr. note the unique characteristics which make SF a valuable resource for understanding history and change, they also discuss how scholars and writers have fought to be taken seriously in academic spheres and the overarching label of all SF as not worthy of literary or intellectual attention. A discussion regarding the use of SF in education must therefore start with a consideration of the fraught relationship between SF and academia. In this chapter I will situate work on pedagogical uses of SF within the genre's relationship with the academy and will consider how SF's position as peripheral to the literary canon has impacted its use in education. Having provided an overview of the SF resources I referred to during curriculum development, and with an acknowledgement that most resources are designed for the postsecondary level, I will conclude this chapter with an extended discussion regarding how SF concepts can be adapted for use in high school English classrooms.

Exclusion from the Canon

P.L Thomas (2013) in *Science Fiction and Speculative Fiction: Challenging Genres* argues that "The canon of works endorsed and even allowed in English classrooms [...] is a powerful and corrosive dynamic" (p. 5). With regards to the inclusion of SF in English education at the secondary level, Thomas places at the center of his discussion a rejection of the exclusionary nature

of the canon and its dominance in language arts education. Because of SF's longstanding exclusion from the canon, the genre is a particularly useful vehicle for reimagining text use in schools and approaches to English education. Gary Westfahl and George Slusser (2002) in *Science Fiction, Canonization, Marginalization, and the Academy* similarly discuss the relationship between SF and the canon:

[...] science fiction offers unusually fertile grounds for an examination of these continuing processes of literary canonization and marginalization. For science fiction has been one major bone of contention in academic arguments over the canon, has carried on its own internal arguments regarding the canon of science fiction, and has faced the special challenge of forces beyond academia which create and champion their own canons. (p. 2)

Slusser and Westfahl begin their conversation on SF with a consideration of the genre's struggles within the SF community and externally within broader literary circles in part because of the impact these challenges have had on the history of the genre. Andy Sawyer and Peter Wright (2011) reflect on these challenges in *Teaching Science Fiction* as well, noting:

The acceptance of science fiction as a literature worthy of discussion and analysis was not easily won, and resulted from a number of factors arising within the literature and the academy itself. Like many 'popular' forms, it suffered from its association with mass-market modes of production such as pulp magazines and cheap paperbacks, its use of stereotypical characters, melodramatic plots, and prose that often veered between the colourless and the hyperbolic. (p. 1)

Addressing the challenges SF faced as a ‘popular’ form is a natural place to begin an exploration of educational research and development in this area, as exclusion from academic and literary circles has limited the kind of work being done to make SF pedagogically accessible to educators. As a result of these challenges, texts on teaching SF only begin appearing in the 1970’s alongside increased critical attention by academics. Interestingly, very little has been done since to update approaches to teaching SF and efforts to do so are almost exclusively at the postsecondary level.

Early SF Educational Resources

Authors conducting foundational work on teaching SF placed more emphasis on uses of the genre at the secondary level than recent scholarship on the subject, although it is important to note that teaching SF is still largely discussed in the context of undergraduate courses in early educational resources on SF. David L. Allen’s *The Ballantine Teachers’ Guide to Science Fiction* (1975) and Jack William’s *Teaching Science Fiction: Education for Tomorrow* (1980) are two of the earliest examples of texts that explore teaching SF, and remain a rarity in their reference to SF as a pedagogical tool at the secondary level.

The Ballantine Teachers’ Guide to Science Fiction is one of the first SF educational resources published, and is uniquely utilitarian in its approach. David L. Allen (1975) begins with speculations regarding the definition of SF, but discusses these definitions and characteristics in the context of teaching. Allen also provides a chapter on ‘categories’ of SF in order to make the genre more manageable for educators exploring SF for the first time – an approach which I used to facilitate students’ entry into the genre. The rest of the text is divided into chapters based on various SF novels, with suggestions on lessons, themes and approaches to teaching. Allen also

prefaces this text with a contemplation of the advent of SF in education, making the following observations:

Science fiction is relatively new to schools and classrooms. It seems to be moving in partly because people who grew up reading science fiction are becoming teachers and partly because, with a new freedom, students are requesting courses dealing with something they like. [...Teachers] are finding it a way to turn kids on to reading and discussion. (p. 18)

For Allen, both teacher and student interest in SF are significant contributing factors in the emergence of SF as an educational tool, and he uses this as the basis for developing teaching strategies and suggestions for best practice. *The Ballantine Teacher's Guide to Science Fiction* remains one of a few texts that focus exclusively on SF at the secondary level and, while useful, is in desperate need of an update. Jack Williamson (1980) departs from the emphasis on high school teaching strategies with his text *Teaching Science Fiction: Education for Tomorrow*, but does still touch upon aspects of teaching SF at the secondary level that are worth noting. In particular, the chapter on "Science Fiction in the High School" by Elizabeth Calkins and Barry McGhan (1980) based on their 1972 text *Teaching Tomorrow: A Handbook of Science Fiction for Teachers* provides useful insight into practical applications of SF in secondary English classrooms. However, Williamson's departure from SF in secondary classrooms in favour of conversations addressing teaching SF at the postsecondary level is part of an ongoing pattern in scholarship at the intersection of SF and education that requires anyone interested in the subject adapt resources, strategies and approaches suggested for university classrooms to the needs of secondary students.

Contemporary Pedagogical SF Scholarship

Although this poses issues regarding the accessibility of the genre for interested high school teachers, there are texts about SF and postsecondary education that still provide useful insight into the characteristics of SF that make it uniquely suited for education for interested secondary school teachers. Sawyer and Wright's *Teaching Science Fiction* (2011) is one example which I drew from extensively by adapting their postsecondary teaching strategies to the unique needs of secondary students. *Teaching Science Fiction* consists of a collection of essays from practicing postsecondary educators who run their own science fiction courses. This text summarizes various approaches one could take when considering starting an undergraduate SF course, including historical and 'issue'-based approaches, and interdisciplinary projects involving using SF to provide science students with well-rounded skills.

The collection begins with a brief history of SF, followed by a consideration of genre terminology, including information on terms like Darko Suvin's cognitive estrangement and the concept of the novum. What follows are essays on historical periods in SF's development and how to teach these periods in the context of cultural history. In the essays concerned with an 'issues' based approach to teaching science fiction, all contributors include reading lists, activities they do with their classes, and specific issues involved in their approach. Although this text focuses on postsecondary uses of SF in teaching, *Teaching Science Fiction* is arguably the most accessible contemporary text for secondary teachers interested in teaching SF because of the practical approach contributors take in each chapter.

Many of the contributors to *Teaching Science Fiction* opted for more discussion-based approaches to teaching SF, including various forms of assessment. All approaches included some

form of diagnostic assessment, often beginning with the professor gathering information concerning the class' experience with the genre. Through using a questionnaire at the beginning of the unit I also found this a useful place to begin engaging students in the genre. However, through providing multiple approaches for the potential SF educator, *Teaching Science Fiction* suggests that a course on SF does not need a rigid structure, and that the genre can be 'entered into' at a variety of access points. Focused on discussion and an understanding of student experience with the genre, all contributors suggest a course on SF can be critical and interactive. This collection of perspectives on teaching SF shows the flexible nature of SF as a genre which can be used to teach in a variety of ways. With articles by a wide range of SF educators with different purposes for using SF in the classroom, Sawyer and Wright's compilation provides insight into using SF to teach cultural history, science, literature, and more specific genre and sub-genre oriented courses.

Young adult science fiction publishing and pedagogy. While there remains little work on the subject of SF in high school education since the acceptance of SF into academic spheres decades ago, Farah Mendelsohn (2009) in *The Intergalactic Playground* provides a much needed resource on children's and young adult science fiction (YASF) which also has use for interested educators. In *The Intergalactic Playground*, Farah Mendelsohn focuses more on issues within children's and YASF publishing and approaches than on the educational use of SF in schools. Although her discussion of what makes SF effective as a form of children's and young adult literature is beneficial on a pedagogical level, her argument remains relatively inaccessible to those without a background in SF scholarship and ongoing conversations regarding a definition for SF and the genre's future. That being said, there are certain aspects of *The Intergalactic Playground* that are worth noting when discussing both the resources available at the intersection of SF and

education and an increased need for more application-oriented work on the subject for teachers. Most significant is the chapter titled “Best Practice Now” where Mendelsohn makes suggestions from hundreds of children’s and YASF books she read in preparation for writing *The Intergalactic Playground*. Although not directly about educational practice, this text provides valuable insight into text selection and ultimately what helps children and youth connect with SF stories.

Limited SF Resources and Challenges

The four texts noted above are indicative of the kind of resources that have informed the study upon which this thesis is based – many of the texts about the use of SF in high school classrooms are outdated, so while their contributions are valuable they are not connected to the real lived experiences of students today. Meanwhile, relevant contemporary contributions to this area seem to abandon secondary schools entirely in favour of conversations surrounding postsecondary applications for the genre or focus on aspects of children’s and YASF peripheral to education, forcing teachers interested in engaging in this kind of work to modify often highly theoretical works. In Karen Hellekson, Craig B. Jacobsen, Patrick B. Sharp and Lisa Yasek’s *Practicing Science Fiction: Critical Essays on Writing, Reading and Teaching the Genre* (2010) which I will refer to in more detail in the following chapter on critical theory, the authors address complications related to this issue of a seeming lack of resources in SF and education:

[...] a history of the teaching science fiction in higher education might be constructed from the infrequent journal articles, conference proceedings, anthology introductions, memoirs, and full volumes that specifically address teaching science fiction. The scholarly history of teaching science fiction literature and film in college stretches back four decades and includes books and essays by such science

fiction luminaries as Jack Williamson, James Gunn, and Samuel R. Delany. The scholarly tradition of teaching *with* science fiction is every bit as important as the scholarly tradition of the teaching *of* science fiction, but much more difficult to trace. Pedagogy that uses science fiction texts as a tool, rather than as the subject, appears in a wide range of disciplines that have only dim awareness of one another.

(pp. 8-9)

What the authors here note is the difficulty with which one finds SF educational resources – scattered throughout various disciplines and mediums, a concrete body of work at the intersection of SF and education remains difficult to locate. While SF is increasing in popularity and more work is being done in this area, I noted a few common patterns in research which fall outside my focus within this project: approaches which conflate science fiction and fantasy, ignoring the genre characteristics of SF which I argue are increasingly important in order for SF to be considered a ‘critical’ genre, or that take a defensive stance as opposed to a practical one in justifying SF being used in the classroom (Bucher & Manning, 2001; Cook & Dinkins, 2015); considerations of SF in relation to technology in education (Alexander, 2009; Andrews, 2015; Berne & Schummer, 2005; Mason, 2013); or work that explores the use of SF in subjects other than English, most notably in science courses (Oravetz, 2005; Singh, 2014; Smith, 2009; Subramaniam, Ahn, Waugh, & Druin, 2012; Vrasidas, Avraamidou, Theodoridou, Themistokleous & Panaou, 2015). In addition, much of this research is conducted at the post-secondary level. The issue of lacking a coherent body of work on both the teaching *of* SF and teaching *with* SF alongside a shortage of contemporary texts that address genre use at the secondary level suggests that, while there is a great deal of scattered work on the subject of SF and education, more work must be done in secondary school contexts if

SF is to enjoy the same popularity it has at the undergraduate and graduate level.

Developing SF ‘Literary Devices’: Curriculum Connections

In their contribution to Jack Williamson’s *Teaching Science Fiction: Education for Tomorrow* titled “Science Fiction in the High School,” Elizabeth Calkins and Barry McGhan (1980) begin their consideration of SF in the high school classroom by stating that: “The first and most important use for SF is to meet students’ reading needs” (p. 82). While it is important to note what SF texts can contribute to the classroom that other genres may not, it is central to any argument promoting the use of SF in education that SF texts can also help to further literacy skills which continue to be important in today’s society. Not only does SF offer unique opportunities for learning which differ from other types of texts, but SF allows for the same explorations typical of any other novel study in secondary English classrooms. For example, SF texts allow for an exploration of character, plot, theme, and other often analyzed aspects of fiction texts, but also allow for engagement with cultural history and contemporary issues in ways that are required through *The Ontario Curriculum for English* and assist students in engaging in various forms of assessment through metacognition and reflection as outlined in Ontario’s *Growing Success* document. Having already specified how specific curriculum expectations were met in the study portion of this thesis, here I will explore specific suggestions SF educators have made for teaching the genre and will discuss how I adapted SF concepts for secondary school English classrooms.

SF as a flexible pedagogical tool. In a conversation between Gregory Benford, Samuel Delany, Robert Scholes, Alan. J. Friedman, and John Woodcock (1979) titled “Teaching Science Fiction: Unique Challenges” published in *Science Fiction Studies*, Robert Scholes celebrates SF as a flexible pedagogical tool for diverse educational goals:

You can do a lot of things with SF. You can use it, as Greg Benford does, to teach physics. I think it should be immensely useful to teach the social sciences. I myself teach it as literature, and I think that teachers of modern literature should deal with it as such. [...] but it seems to me that the one thing one doesn't want to do is to say, this is really not literature, it's some special sub-cultural form which is fun to study by itself or can be used to teach physics. Sure it can, and it can be used to teach a lot of other things. It is also important literature, usefully critical of contemporary culture, and in many respects the thing we need more of than we need of most other kinds of fiction at the present time. (Scholes, "Unique Challenges")

Scholes encourages educators interested in teaching SF to use SF texts alongside other realist or mundane works so that its scope is not limited by generic categorization. However, Scholes ultimately identifies SF's most significant contribution to education as its inherent critical bent, and the potential the SF text has for encouraging critical considerations of contemporary culture and society. The comparison between SF texts and realist texts here is significant. David L. Allen (1975) even suggests this be a starting point for introducing students to SF as he tells the reader, "As far as the generic approach is concerned, involving classes in trying to answer the question "What makes science fiction different from other kinds of fiction?" and variations on it is more apt to stir interest than providing some definition and working from there" (p. 3). The benefits of teaching SF alongside other works are emphasized further by science-fictional content in popular culture. Students can use their own experiences with SF, be it with novels, video games, movies, or television shows, to begin to understand how SF is different from other forms of literature and what it does differently from mundane texts. On the struggle new readers of SF experience, Scholes (1979) states that "[...] the problem is an imaginative problem" (Scholes, "Unique Challenges").

While using SF in a class that is not focused primarily on SF, which describes the classroom of the typical educator interested in using some SF texts in any common high school course, can be daunting, encouraging students to make connections between their everyday interactions with science and science-fictional occurrences in their daily lives can help to bridge that gap for both students and educators alike.

SF informing students' world view. Returning once again to Elizabeth Calkins and Barry McGhan's contributions to *Teaching Science Fiction: Education for Tomorrow*, Calkins and McGhan (1980) state that an "important reason for using science fiction with high school students, related to the author's concentration on developing a worldview, is that it can help them to develop a coherent view of their world" (p. 84). When commenting on using SF pedagogically, many of the educators I have noted believe SF has the structural potential to clearly represent the reader's world in dynamic ways. Calkins and McGhan are drawn here to the idea of world-building and perspective, which can also be used to establish a foundation for further genre-based investigation. The content allows for issue-driven discussion, but the interest here is also on encouraging students to draw connections between the future and alternative worlds depicted in the SF text with their own. In "Preliminary Reflections on Teaching Science Fiction Critically", Charles Elkins and Darko Suvin (1979) maintain that "The main and the highest goal of SF teaching — as of all teaching — ought, in our opinion, to be a specific form of civic education" (Elkins and Suvin, "Teaching Science Fiction Critically"). Here we are brought full circle – the structural elements of the SF text and text-specific content can be used together to create a classroom experience that encourages discussion and the critical interrogation of assumptions both within the text and within the contemporary world of the reader. Both theoretical considerations of SF as a genre and work specifically on the merits of SF as a pedagogical tool highlight the strength SF has a genre to assist

educators in developing students who are critically aware and who can think critically, so as to support individuals who will have the skills necessary not only to engage in an increasingly complex world, but who will also enact positive change through adopting multiple perspectives and diverse ways of thinking. Educators can build upon students' prior reading experiences to introduce students to SF and, in doing so, help students explore the genre as a set of critical tools while they read.

Approaches to adapting SF concepts in the classroom. At the beginning of the unit for the in-school study upon which this thesis is based I provided an introduction to the genre (see appendix F). Students had already been reading Octavia Butler's *Parable of the Sower* (1993) for a week before I had arrived, and their classroom teacher did not identify science fictional aspects of the text in her exploration. Focusing on religious allegories present in the novel alongside a close reading of the text with attention paid to metaphors and writing style, students had already applied commonly used literary devices to the text. Given this kind of literary introduction to the novel, my approach in introducing students to a genre study of the novel followed a similar pattern. My objective for this initial conversation was ultimately to open up students' understanding of what constitutes a SF text, to provide categories to guide their exploration of the genre, and to introduce them to concepts central to the structure of SF stories. These concepts I termed SF literary devices, and encouraged students to apply them in similar ways to those literary devices they were already familiar with as ways to bring out hidden content within SF stories. In this initial lesson I facilitated opportunities for students to think about SF beyond common tropes such as aliens and space travel, to see that there are different kinds of SF, and to suggest that SF texts could be meaningfully engaged with using skills they had already developed through other forms of literary analysis. In this way, adapting SF concepts to secondary school contexts through likening

structural aspects of the genre to literary devices allowed me to provide students with various ways of entering into *Parable of the Sower* as both an SF text and as a novel that would allow them an opportunity to continue expanding upon preexisting literacy skills. In the following sections I will discuss how I adapted SF literary devices to facilitate student learning as students explored aspects of SF texts.

Novums. Novums² are a significant part of what distinguishes SF from other texts and thus seemed a natural place to start in introducing students to the genre. Istvan Csicsery-Ronay Jr. (2008) in *The Seven Beauties of Science Fiction* states that the “concept of the novum, introduced in sf studies by Darko Suvin, refers to a historically unprecedented and unpredicted “new thing” that intervenes in the routine course of social life and changes the trajectory of history” (pp. 5-6). For Darko Suvin, the novum distinguishes the science-fictional world from that of the reader’s – it embodies the primary differences that make the society depicted separate from our own perceived realities. Furthermore, it is the most crucial SF trope, the literary device that is present in all SF works and which makes all the difference in any given SF text. From the novum, meaning is generated through differences between the SF story and the reader’s contemporaneous moment.

Regarding how an SF novum functions, Csicsery-Ronay Jr. claims that the “sf novum is a stone thrown into the pool of social existence, and the ripples that ensue. [...] The sf novum is most often a newly discovered or invented object/process that changes the course of history” (p. 59). The SF novum, in this way, typically impacts every part of the story. Entire worlds are

² While it is common practice to use ‘novums’ as the plural form of ‘novum’ in contemporary SF scholarship as Istvan Csicsery-Ronay Jr. (2008) does in *The Seven Beauties of Science Fiction*, the correct pluralization of novum would be ‘nova’. Because both Darko Suvin (1979) in “SF and the Novum” from *Metamorphoses of Science Fiction: On the Poetics and History of a Literary Genre* and Ernst Bloch, who coined the term ‘novum,’ avoid using the term in the plural by envisioning a perfect novum (‘the novum’), I have chosen to use the pluralized form of novum most common in contemporary SF scholarship.

changed by the introduction of the ‘new thing’ that the author introduces into the fictional world, and is therefore the difference between the reader’s world and the fictional world which the reader is invited to consider. A successful novum is one that does not merely exist within its realm, but which changes all aspects of it. The success of the novum can also be gauged by its ability to force the reader to consider such difference. Because of how novums work in SF, the “genre [...] is an engine for providing new concepts” in that it makes the reader aware of new kinds of differences which can assist the reader in thinking through contemporary issues in new, previously unconsidered ways, without waiting for historical moments of change to spark revelation (Csicsery-Ronay, 2008, p. 57). Looking at how novums function in a pedagogical manner, Sawyer and Wright (2011) in *Teaching Science Fiction* claim that “science fiction draws our attention to what Suvin calls the *novum* – the ‘new thing’ – which tells us that we are estranged from the world of mundane fiction and invites us to consider the nature of this estrangement” as “*sf literalizes the metaphor*” (pp. 9-10). While in mundane fiction metaphors are used to address overarching issues or themes, SF allows readers to imagine how the world would change if inventions thought out of reach actually existed and how the world would change as a result.

Because of the importance of novums in understanding how SF operates as a genre, the novum was the first SF literary device I introduced to students. I based my teaching of novums on three questions: A definitional, genre-based approach through the question “What makes science fiction different from other genres?”; an identification-based approach to novums prompted by the question “What do novums look like?”; and, finally, a prioritizing approach, or “How do I know which new thing is *the* novum?” (see appendix G) The first question was addressed through a discussion regarding what separates SF from other genres, particularly fantasy. A novum is the big new thing that makes the SF world presented different from the reader’s. Drawing from examples

many students cited as being familiar with such as Suzanne Collin's *The Hunger Games* (2008) and through our reading of Paolo Bacigapuli's short story "The People of Sand and Slag" (2004), students were encouraged to consider what in those stories informed them the world presented was fundamentally different from their own. The structure of novums was also a point of emphasis in this lesson, as novums can materialize in an SF story in a variety of ways – a new planet, a scientific discovery, a drastic change in something familiar to the reader, or even a different societal structure. Students could very easily identify characteristics of various SF stories that were different from their own reality, but ultimately struggled to identify what *the* novum was – the thing that made all the difference in a text. Through a guided reading of "The People of Sand and Slag" and direct references to their novel study of Octavia Butler's *The Parable of the Sower*, students were given multiple opportunities to compare potential novums in these texts and consider where rupture occurs between the futures in the texts and their own world and, in doing so, began to explore what makes an SF text different from more realist considerations of contemporary problems.

Cognitive estrangement. Having engaged in the consideration of how SF can be used to explore contemporary problems in ways different from other types of texts, I then introduced students to the concept of cognitive estrangement. Cognitive estrangement, I argue, makes SF an effective pedagogical tool, and is closely connected to processes of critical thinking (see appendix H). At the heart of this literary device is an analysis of what happens to the reader when they read SF, and the inclination readers have to compare the future depicted in SF texts with their own present. In his introduction to *Teaching Science Fiction: Education for Tomorrow*, Jack Williamson (1980) claims that "The most successful teachers are motivated, I think, by a sense that science fiction has a special relevance to life in our transitional times" (p. 15). Cognitive

estrangement is an active thought process which allows readers, and therefore students, to consider contemporary issues from a distance, facilitating critical engagement in a way that can also be enjoyable for the reader. Even texts which are explicitly engaged in critical content can provide this experience of enjoyment, even more welcomed in an educational setting where perhaps fun was not anticipated by the student. In their introduction to *Speculations on Speculation*, James Gunn and Matthew Candelaria (2005) comment on the possibility of enjoyment even in the critical process of engaging with SF:

In the science-fiction story, on the other hand, realistic questions are essential for full understanding and enjoyment; the reader is supposed to compare the fictional world to the real world and find it not only better or worse, or simply different, but be able to ascertain what makes it better or worse or different. (p. 10)

Interrogation of texts can be an enjoyable form of learning for students who are so frequently asked to accept literature as it is. In *The Ballantine Teacher's Guide to Science Fiction*, David L. Allen (1975) mentions the enjoyment involved in SF as well, claiming that “Another element of fun in science fiction is the sheer joy of speculating about how things might be if some element in our world were to be changed” (p. 15). That innate interest in asking questions about the world, a key component to critical thinking, can in this way contribute to enjoyment on the part of the student when working with educational materials.

By explicitly teaching cognitive estrangement as both a literary device and a thought process which students engaged in while reading SF, my hope was two-fold: First, that students would become overtly aware of what happens to their thinking when they read SF and, second, that students would begin making the connection between SF and various critical thinking skills

which they already possessed and engaged in sometimes unknowingly. As a result of these goals, the lesson on cognitive estrangement involved considering what critical thinking is, with a resulting discussion which will be addressed in the next chapter. Students were encouraged to consider the importance of comparing SF futures to their own present moment, and to consider what they could learn from SF futures. Although students struggled to apply cognitive estrangement to their experience of SF texts in their written final assessment, the following response from an exit interview conducted with one of the students reveals the usefulness of explicitly teaching cognitive estrangement as a thought process: “You have to relate science fiction futures with the present. It has helped me think critically. I looked at the bigger picture. Science fiction helps us in general to compare futures with the present, to see how things could be.” Students largely acknowledged that they weren’t just reading SF stories or watching SF movies and television shows, but that they couldn’t help but compare the future to the present.

Extrapolation. The concept of extrapolation central to SF is also a significant part of what makes SF a critical tool for teaching. Debra Benita Shaw (2008) in *Technoculture: The Key Concepts* states the following:

[The term extrapolation] refers to estimates about the future based on known facts and observations but it has been adopted by SF academics to describe the thought process which SF writers employ in constructing future and alternative worlds. Science fiction is never really about the future but it makes use of the future to extrapolate from the cultural conditions of the author’s time and place. It is a projection of what might be, given the current state of society and, perhaps more importantly, it takes for granted that social conditions are structured by, and a fundamental structuring element in, the development of new technologies. (p. 1-2)

The basis of the teaching portion of this study involved directly engaging students in thinking about this extrapolative process, making connections between the future of the text and their present explicit. In *Young Adult Science Fiction*, C.W. Sullivan III (1999) acknowledges the importance of the extrapolative method to engage in learning through SF when he discusses extrapolation and the use of realistic novums:

The good science part, even when it relies on the “soft” sciences, provides a believable extrapolation; the good fiction part puts that extrapolation into a setting with characters and actions that compel the reader’s attention and, hopefully, consideration. In the best sense, then, to paraphrase Heinlein, science fiction is the literature of the present that can best prepare readers for the future by exposing them to a variety of possible futures and by giving them some fictional experience in dealing with the new, the unusual, and the challenging. (p. 3)

He elaborates on this point and the potential SF has through extrapolation to prepare students for potential futures, stating this potential “lies in the extrapolative nature of the genre itself. No other genre is so free to imagine the possibilities of other worlds, societies, and times as science fiction” (Sullivan III, 1999, p. 1). While SF as a genre should not be reduced to the predictive nature of what an SF author does when they create a science fictional future, the concept of extrapolation does facilitate critical engagement with texts for students in this way. The fact that SF stories, or at least those rooted in logic and accepted scientific principles, are developed based on the present of the author and their contemporaneous concerns allows for students to learn from SF as a genre deeply rooted in the present even as stories take place in sometimes distant futures.

While cognitive estrangement impacted how students’ thought about what happens when they interact with SF stories in a variety of forms, students were able to apply extrapolation more

effectively to texts as a literary device. Although I made sure students were aware that the development of SF futures can be both a creative and critical endeavor, I likened the extrapolative process to temporal thought experiments for the purpose of presenting extrapolation as a literary device that students could use to understand SF texts. In the ‘thought experiment model’ I used to teach extrapolation, students were encouraged to see how authors take their own present and the way the world is when they were writing, ask how the world might be if certain aspects about their present stay the same or get worse, and imagine the resulting future in the form of fiction (see appendix I). Drawing from Farah Mendelsohn’s view in *The Intergalactic Playground* (2009) that “identification of the novum and cognitive dissonance usually leads to the idea of causality and consequence” where the “‘what if?’ needs to be following by the concept of ‘if, then.’,” extrapolation being viewed as a literary device ultimately allowed students to see consequence in the futures they explored and an increased need for action to prevent dystopian futures from becoming reality (p. 13). This was the most widely cited use students found for science fiction, and supported many students’ answers when asked in their exit interviews if SF should be taught in schools. The concept of consequences for one’s actions came up a significant amount as illustrated in the following excerpts from students’ exit interviews:

Yeah, science fiction should be taught in schools. Gets people thinking about the future and our impact.

Studying science fiction showed me Parable of the Sower is actually possible if we are stupid enough, so the post-apocalyptic part is a warning.

Yeah, I think so. I think it’s a good and interesting way to talk about issues without just talking about them. That can get boring. But SF also makes it more pressing and concerning ‘cause you see it happening.

Yeah, I do actually. It’s a good way to show implications of actions today...It’s good to show kids there are consequences.

When asked if their definition for science fiction had changed from the questionnaires they filled out at the beginning of the study, many students also discussed the predictive quality of SF and the connection the genre makes between the present and the future as something they previously hadn't considered.

Part of students' appreciation for extrapolation as a useful literary device for understanding SF might be attributed to the amount of time spent on the topic. Following the lesson on extrapolation, students were asked to take one quote from *Parable of the Sower* and connect it to contemporary contexts. This task was the basis for a class-long discussion on various topics and explicit references to the novel being studied. Emphasis was placed on extrapolation as a significant literary device seeing as students' final assessment for the science fiction unit was necessarily extrapolative in nature. Because students had to make explicit connections between the future problems explored in the novel and contemporary events, practicing extrapolative thinking in the context of SF was crucial to scaffolding student learning in this regard.

World building. Given the importance of extrapolation as the process which guides the development of SF futures and worlds, there are certain literary devices or SF concepts that were used to support student understanding of extrapolation and the SF writing process. While I did not explicitly teach world building to the grade 12 students, the concept was mentioned during class discussions (see appendix J). My teaching of this concept was based on the following question: How do science fiction storytellers (writers, directors, designers) build their science fictional worlds? I divided this topic up into four categories, or things writers might consider when creating a science fictional future: Plot/Novum, or what the 'new thing' will be and how it will impact their society; Setting, which encompasses both where the story takes place and temporal distance from the present; Culture/Community, or the sociological behaviours of those the story focuses on; and

Style/Flavour, or how the author wants the reader to feel when they engage with the SF future they have created. I positioned the concept of world building as guided by extrapolation, seeing as authors must consider how closely connected the SF future will be with their present moment. While only mentioned in support of students' understanding of extrapolation, the concept of world building allowed students to pick apart SF texts and explore certain aspects of stories as something which is constructed in a specific way for a specific purpose as designed by the author.

The Absent Paradigm. The absent paradigm is another part of the extrapolative method and world building which can be used as an SF literary device to support student understanding of SF texts. SF authors purposefully do not tell the reader everything about the future they have created. Rather, authors provide just enough information about the world they have developed to support the plot or exploration of the novum they have introduced. The rest of the world, the details peripheral to the main storyline and focus, are often left for the reader to imagine. The absent paradigm can be a useful pedagogical space for students to explore SF futures through inquiry-based learning and creativity, as students can ask questions about the world beyond the text and attempt to fill the world in themselves. Although I referred to the absent paradigm only in passing with students to support their understanding of extrapolation as a writing process, this is a concept through which student learning could be facilitated.

Conclusion

While SF has been established as containing specific structural characteristics that make the genre an effective tool for critically engaging students in aspects of both literary and contemporary exploration, the history of SF being marginalized from the canon continues to impact the amount of pedagogical resources available for educators. Texts focused on secondary school contexts were more common in the 1970s and 1980s than any period thereafter, suggesting

that, if SF is to be more widely used in high schools, a collective effort must be made by those studying SF to develop resources that can be used to support educators who are eager to explore the genre. The suggestions made in the latter half of the chapter regarding how to adapt SF literary devices for the secondary level are therefore intended to provide a foundation for future explorations and applications as more resources are developed and teachers become more comfortable with SF as a pedagogical tool.

Chapter Four - Critical Theory: Frameworks for Envisioning the Future

In this study, I used critical theory (CT) to provide students with an additional set of tools in analysis, particularly with regards to connecting SF texts to contemporary issues. Having scaffolded students' structural understanding of SF through their interactions with "The People of Sand and Slag," using CT as a pedagogical tool allowed me to facilitate further depth in analysis as students turned their attention to *Parable of the Sower* and their final assignments. Guided questions related to each of the CT lenses I introduced students to challenged them to explore the text in specific ways beyond their initial understanding of the text, and had the additional benefit of helping them make explicit connections to the present. In this chapter I will consider in more detail how CT helped students refine their understanding of what it means to think critically, will discuss how I introduced the concept of CT through a discussion-oriented framework, and will explore students' in-class analysis of *Parable of the Sower* and other supporting texts through the following CT lenses: feminist literary criticism, Marxist literary criticism, postcolonialism, historicism and new historicism, and biographical criticism.

Expanding on Critical Thinking

During exit interviews when asked if SF should be used in schools, one student made the following observation: "[SF] should be used because kids these days should be aware of what's going on, and what could happen. Also, critical theory will help them ask better questions, to really learn from what they're reading." Certainly, one motivation that I had in using various approaches to support students' exploration of SF as a genre was to provide students with sets of questions that would help make the novel more accessible for them, and to assist them in making clear connections between the text and the real world. Aaron Passell (2013) in P.L. Thomas' *Science Fiction and Speculative Fiction: Challenging Genres* establishes that SF as a genre has the

potential to “form the foundation of an intellectual process of discovering and interrogating the status quo,” an approach supported by the concurrent use of CT in analysis (p. 61). In students’ initial questionnaires at the beginning of the study, they defined critical thinking as “thinking outside the box,” and my goal in explicitly teaching CT was to make more concrete exactly what “thinking outside the box” might look like in their lived experiences while reading. Deborah Appleman (2015) in *Critical Encounters in Secondary English: Teaching Literary Theory to Adolescents*, a text that was foundational in the development of the CT part of the unit I taught³, notes the importance of teaching CT explicitly, stating that the best way to discover and explore ideologies in texts “as they are found in literature is through the explicit teaching of contemporary literary theory [where] theory provides readers with the tools to uncover the often-invisible workings of the text” (pp. 3-4). I wanted a way to facilitate pathways into SF texts and to help students learn to think critically through the consideration of SF texts.

Critical Theory and Education

Cornel West (1990; 2005) in his article “The New Cultural Politics of Difference” makes the claim that there is a need to diversify the texts deemed valuable in intellectual spheres, and problematizes the exclusionary practices underlying strict adherence to the canon. West proposes a need for criticism, and by extension the use of texts that engage in “social structural analyses of empire, exterminism, class, race, gender, nature, age, sexual orientation, nation, and region” which interrogate “the complex dynamics of institutional and other related power structures in order to

³ It should be noted that, due to my focus on SF and my use of CT in supporting students’ critical engagement with SF texts, my research on the use of critical and literary theory in high school English contexts is limited mainly to Appleman’s text. That being said, her work in literary theory is introductory and a full exploration of this topic would involve moving beyond her *Critical Encounters in Secondary English: Teaching Literary Theory to Adolescents*. However, her approaches to literary theory in the classroom as broad approaches framed as overarching questions and the supporting practical resources within this text provided the scaffolding I required given the scope of the project on which this thesis is based.

disclose options and alternatives for transformational praxis” (p. 37). With an emphasis on coalition instead of the polarization of voices and perspectives, West insists that the “challenge principally consists of forging solid and reliable alliances to people of color and white progressives guided by a moral and political vision of greater democracy and individual freedom” as they “aim is to dare to recast, redefine, and revise the very notions of ‘modernity,’ ‘mainstream,’ ‘margins,’ ‘difference,’ ‘otherness’.” (p. 22) It is with these goals in mind that I not only propose that educators use an increasingly diverse range of texts in their classrooms, but also that teachers encourage their students’ use of critical reading practices that assist them in adopting a variety of perspectives.

Regarding why CT should be used to support students’ literacy practices in high school English classrooms, Appleman (2015) states: “The purpose of teaching literary theory at the secondary level is not to turn adolescents into critical theorists; rather, it is to encourage adolescents to inhabit theories comfortably enough to construct their own readings and to learn to appreciate the power of multiple perspectives” (p. 8). While I do not think encouraging students to become critical theorists themselves would necessarily be a bad thing, Appleman’s idea of assisting students in adopting multiple perspectives or ways of seeing is crucial given the diverse populations seen in schools, and the negative impact of exclusionary reading practices on marginalized student communities. However, the inclusion of CT in secondary school contexts is hard won, as Appleman notes: “Students and teachers alike find it hard to believe that something as abstract and “impractical” as literary theory could be relevant to their lives, both in and out of the classroom” (p. 4). For students being taught CT approaches for the first time, it is therefore significant that students see how different ways of thinking can benefit them both while they are reading and in their lives. During exit interviews, one student emphasized the importance of

inhabiting multiple perspectives, arguing that CT and different modes of thought should be taught “because everyone would benefit from a different way of thinking. The more ways you can think the more versatile you are, and that’s good for everyone no matter what you do. Especially going to university, they want people who think differently.” As both an inclusive pedagogical tool and as a way to encourage students to think in diverse ways, the explicit teaching of CT alongside texts that honour alternative ways of seeing supports students’ literacy development and offers them tools that can support them in their lived experiences.

Appleman (2015) also suggests real-life application as one of the benefits of teaching CT:

Literary theories provide lenses that can sharpen one’s vision and provide alternative ways of seeing. They augment our sometimes failing sight and bring into relief things we fail to notice. Literary theories recontextualize the familiar and comfortable, making us reappraise them. They make the strange seem oddly familiar. As we view the dynamic world around us, literary theories can become critical lenses to guide, inform, and instruct us. (p. 4)

While CT is taught as a reading practice in secondary English classrooms when it is taught at all, the real benefit of teaching such approaches is that students can apply what they have learned to their own lives. Given the emphasis on the development of critical thinking skills in this study, my goal was to encourage students to see how CT might help them solve problems they face or understand issues that concern them, mirroring this hope Appleman has for teaching CT: “Critical encounters with literary theory also help students to read the world around them. Teachers hope that students will be able to integrate successful strategies for learning in school and to adapt those strategies to life as well” (p. 146). In the chapter “What We Teach and Why,” Appleman quotes

Paulo Freire who charges teachers with the job of teaching adolescents to read both the world and the word through interactions with literacy practices, making this concept a useful place to begin my participants' exploration.

I introduced the concept of CT to students by asking them to discuss in their table groups what it means to "Read the word and the world," the title of Paulo Freire and Donaldo Macedos' text on emancipatory literacy (1987). Students provided a variety of interpretations when they shared parts of their discussions as a class:

It's like seeing a moral in a story, and bringing back what you read into your life.

Seeing that there is a difference between the real world and what the media decides to show you.

What you read dictates how you will see the world.

It means that you should observe the world the same way you pay attention to little details when you read.

I think this has something to do with the power words have, and how important it is to be careful about what you say.

You should make connections between words and the world. What you read can help you understand the world more.

Without prompting, this initial discussion suggests that students had already considered how reading impacts how they understand the world, but few students noted the constructed nature of the world and how the world can be 'read' as a text. As an opportunity for assessment *for* teaching (formative assessment), this discussion was a chance for me to see how students viewed the significance of their own reading practice. In this way, my approach to assisting students in

reconceptualizing the importance of their own literacy is part of a shift in how teachers approach reading:

We are no longer transmitting knowledge, offering literature as content, as an aesthetic experience or as neutral artifacts of our collective cultural heritage. Instead, we are offering our students the tools to view the world from a variety of lenses, each offering a unique perspective sure to transform how adolescents read both words and worlds. (Appleman, 2015, p. 12)

By teaching CT and emphasizing the potential literature has to assist students in adopting multiple perspectives which can be applied to real-world contexts, we are inviting students to become active participants in both their education and in their broader communities.

Critical Thinking Skill Development

The connection between students' exploration of multiple perspectives and the development of critical thinking skills has been established most notably in the context of research on the uses of multicultural literature in secondary English classrooms. Richard Beach, Amanda Haertling Thein and Daryl Parks (2008) in *High School Students' Competing Social Worlds: Negotiating Identities and Allegiances in Response to Multicultural Literature* consider the pedagogical and critical potential of students' explorations of multiple perspectives and the fostering of identity development in youth through a study on the use of multicultural literature in classrooms. They describe their study as being informed by the following findings:

Adolescents do not simply construct their identities on their own; they construct their identities through their participation, competing social worlds of peer group, family, school, community, and workplace (Beach & Myers, 2001; Pheelan,

Davidson, & Yu, 1998). In this socialization, they learn particular race, class, and gender practices associated with being perceived as certain kinds of persons in certain social worlds. [...] it is important to understand how adolescents learn to entertain alternative perspectives through responding to dialogic tensions portrayed in literature. In an increasingly diverse society, adolescents need not only to acquire tolerance for diverse perspectives but also to learn to critique the institutional forces perpetuating racism, class inequality and sexism that work against openness to diversity. (Beach, Thein & Parks, 2008, pp. 6-7)

According to the findings of Beach, et al. (2008), students' exposure to alternative perspectives facilitates their growing ability to be critical, changing how students move through their communities and the world. When interacting with multicultural literature, students have the opportunity to "[discuss] how characters are constituted by institutional forces shaped by discourses of race, class, and gender, [where] students may begin to critically examine how their own identities are shaped by these discourses" (Beach, et al., 2008, p. 70). This thinking leads students to apply critical lenses to their own experiences and beliefs, as students see aspects of their own experiences reflected in what they read and, in doing so, build on their own sense of self.

While Beach, et al. focus largely on the importance of text selection, and arguably in this thesis I do as well, many educational theorists suggest the classroom must change in a multitude of ways to better prepare students for life in the twenty-first century. These changes involve alternative approaches to teaching such as the use of CT and how learning, knowledge and community are approached as concepts in classrooms. Stephen Brookfield (1987) outlines the importance of a liberal educational setting in *Developing Critical Thinkers*, and what a classroom that promotes critical thinking must consist of if a focus is to be placed on critical teaching:

A number of educators have described the developments of critical thinking in learners as critical teaching. [...] liberating classrooms become separate zones for changing consciousness in which learners are able to break free from habitual patterns of thought to view their worlds in new ways. [...] the concept of liberal education focuses on fostering creativity, student self-direction, and an openness to a diversity of interpretations of any particular topic, area of knowledge, or theory. (p. 80)

While these suggestions are revealed most clearly in practical application through the subtleties of establishing class rapport, it is no less important to discuss ways critical thinking can be encouraged through a critical approach to education.

bell hooks (2013) echoes Brookfield's focus on critical approaches to education as being linked to students' acquisition of critical thinking skills in *Teaching Critical Thinking: Practical Wisdom*, identifying that critical thinking is a fundamental aspect of learning:

The heartbeat of critical thinking is the longing to know – to understand how life works. Children are organically predisposed to be critical thinkers. Across the boundaries of race, class, gender, and circumstance, children come into the world of wonder and language consumed with a desire for knowledge. (pp. 7-8)

While Brookfield is concerned with fostering critical thinking in adults, hooks suggests here that critical thinking is something which can be found naturally in the inquisitive nature of children, arguing that asking questions is an automatic method of knowledge acquisition. Making this connection between critical thinking and children apparent, hooks expresses a similar concern regarding how schools must work to support democratic values, as she states, "Now more than ever before in our nation, we need educators to make schools places where the conditions for democratic consciousness can be established and flourish" (pp. 14-15). The link between critical

thinking skills and effective democracy is once again established here. Critical teaching for hooks allows students to emancipate themselves from societal restraints, and she speaks to the positive experience one who learns to adopt critical thinking as a permanent process may have in the classroom:

Critical thinking in the classroom is one way to cultivate greater awareness. It enables students to better recognize the interconnected nature of life and by doing so brings them face to face with the sacred. They find themselves capable of a conscious process of watchfulness that is mindful and aware. (p. 149)

Both Brookfield and hooks present critical thinking as a positive and liberating venture, one which must be encouraged by educators interested in developing in their students a heightened awareness of their power to change their worlds for the better. An effort must therefore be made towards establishing a classroom where critical thinking is a priority, where discussion is a common practice, and where students are prepared to actively participate in the world, even as pre-existing school structures act against this in many ways.

Discussion-based Approach to Teaching Critical Theory

For hooks knowledge, and particularly literacy, can emancipate the individual from oppression. She identifies a significant problem in education, as “children’s passion for thinking often ends when they encounter a world that seeks to educate them for conformity and obedience only” (hooks, 2013, p. 8). She claims that making critical thinking a focus will help bring back the passion for learning, defining critical thinking as “first discovering the who, what, when, where, and how of things - finding the answers to those eternal questions of the inquisitive child – and then utilizing that knowledge in a manner that enables you to determine what matters most, [...learning that is] self-directed, self-disciplined, self-monitored and self-corrective, [...] an

interactive process, one that demands participation on the part of teacher and students alike” (hooks, 2013, p. 9). At the heart of hooks’ teaching guide on critical thinking is the importance of discussion, assisted by brief lectures, vulnerability, trust, and respect. Alongside these aspects of critical thinking approaches that can be directly embedded in the structure of all lesson planning and classroom foundations, hooks also emphasizes the importance of self-reflection or, in curriculum-based terms, metacognition. In the spirit of hooks’ suggestion that classrooms need to be spaces where students are encouraged to be self-reflective, confidently take intellectual risks, ask questions and be vulnerable in learning as a community, I included in the introduction to my unit on SF a session during which the students and I worked together to establish community expectations. This was an opportunity for students to tell me what their expectations were for me as a guest in their classroom, and a chance for me to communicate what my expectations were of them as research participants.

This discussion-based, collaborative approach to learning in the spirit of democratic pedagogy and critical thinking was one with which students were unfamiliar and therefore initially hesitant to engage in, with one student telling me after a few moments of silence that they “had never been asked what [they] expected from a teacher before.” After some encouragement, students gave me the following suggestions:

Actually listen to us.

Don’t talk down to us.

Give us time to think about your questions before we answer.

Be respectful.

One student raised his hand and told me he expected me to “do my job.” In response, the class was a mixture of laughter and gasps, but this contribution provided me with an opportunity to find out

what students believed my job was as a visiting teacher-researcher, and to clarify the kinds of things they could expect from me. This initial conversation allowed me to begin an ongoing dialogue which I referred to continuously throughout the duration of the study, where I established that I expected students to take intellectual risks, to ask questions, and to engage in respectful conversation about the material we would discuss.

The discussion-based approach to teaching critical thinking through CT I used is a significant factor in the kind of data I collected, the conversations we had as a community, and the kind of learning students engaged in. I lead students into material with questions, ensured the lesson portions of each class were short, and provided ample time for students to discuss content both as a class and in small groups. Students were encouraged to bring in any peripheral knowledge they thought would contribute meaningfully to discussions in class and, as a result, often discussions went even longer than the time I had set for them. In spite of this, in exit interviews the single most common suggestion on ways to improve the unit was to incorporate more structured discussions, and open up more opportunities for students to bring their outside interests into the classroom. Students were eager to make connections between the SF texts, CT and contemporary issues they were interested in, making the ‘real world’ a valuable resource in students’ literary explorations.

Use of non-SF supporting resources. While one of my goals during this study was to see how students’ critical thinking skills developed while reading SF texts, the CT portion of this unit was largely supported by non-SF resources. Part of this decision came from the established importance of connecting literacy practice to the ‘real world,’ and partially from my desire to provide students with a variety of texts with which they could practice applying various CT lenses. I chose to use slam poems related to each CT approach because of the genre’s emotional

accessibility and clarity in thematic content. Students discussed these poems using the provided CT lenses before applying these conceptual approaches to *Parable of the Sower* (1993), and often referred to the poems while exploring the novel as well. Although Appleman encourages teachers to use multiple critical theories with single literary texts to support students' exploration of multiple perspectives, a balanced approach through using different examples and then bringing students back to a core text was an effective approach in this study (Appleman, 2015). Students often expressed excitement at the beginning of the CT lessons, asking me what poem we would be watching that day. They were eager to listen to a wide range of voices, applying what they had learned to many different texts.

Selecting Critical Theory 'Lenses'

Appleman (2015) likens critical theories to the lenses of sunglasses which students can put on and take off at will while reading, as sunglass lenses can vary by colour, polarization and purpose just like CT lenses have unique uses and conceptual characteristics. Using metaphor as a way to help students get over their possible apprehension towards theory, students are meant to view critical theories as modes of thinking they can switch between to explore texts in a variety of ways without being limited to one approach. By normalizing the concept of 'theory', Appleman encourages students to adopt CT approaches as part of how they understand the world, suggesting that:

Critical lenses provide students with a way of reading their world; the lenses provide a way of "seeing" differently and analytically that can help them read the culture of school as well as popular culture. [...] When taught explicitly, literary theory can provide a repertoire of critical lenses through which to view literary texts

as well as the multiple contexts at play when students read texts – contexts of culture, curriculum, classroom, personal experience, prior knowledge, and politics.

(p. 4)

By approaching CT as a series of lenses through which students can look at an increasingly broad range of ‘texts,’ they are encouraged to see that there are multiple perspectives or ways to explore various narratives, events and issues. In response to a question regarding SF and the use of CT, one student said the following:

[Critical thinking] is like looking at a text and seeing it in a different way, putting on a lens and seeing it in a different light. I think using the critical theory lenses when reading science fiction definitely helps us understand the present better. What happens in the book won't happen but there is that scare factor, and I see myself actually reading things and tying it into the real world problems now. I know how to relate it.

This student noted the use CT has in helping students engage with SF texts and real world problems alike, suggesting that reading SF in this way can help students understand and address contemporary issues.

Andy Sawyer and Peter Wright (2011) in *Teaching Science Fiction* also consider SF's unique capacity to explore alternative perspectives in education, noting that the genre:

[has] engaged – often self-consciously – with the key social and political movements of the twentieth and twenty-first centuries, producing a multiplicity of science fictions that engage with feminism, postcolonialism, postmodernism, queer theory, the interaction between self and other, and the collapsing distinctions between the virtual and the real and the human and the synthetic. (p. 5)

In this way, SF has a history of interacting with key issues surrounding marginalization and identity, a history which makes SF uniquely suited to teaching students about potential futures while maintaining critical conversations surrounding students' present realities. This preexisting relationship between SF and various forms of CT, discussed at more length in the next chapter, makes CT an excellent tool to encourage students to engage with SF texts in a variety of ways. Given the wide range of approaches that fall under the umbrella of CT, I decided to teach critical theories as lenses that I knew would apply to the text students were reading while giving them a wide selection of critical thinking methods to choose from based on their own contemporary interests and concerns (see appendix K for handout). While students were given the opportunity to apply many different lenses to texts, they were also encouraged to explore the novel *Parable of the Sower* using methods that interested them, developing specific questions as the foundation of their inquiry.

Exploring *Parable of the Sower* Through Critical Theory

Octavia Butler's *Parable of the Sower* (1993) follows a young girl, Lauren Olamina, in a late twenty-first century America that has fallen apart under the weight of economic and environmental catastrophe. Given the economic conditions that Lauren explores through reflections on her own family, those living outside the walls of their community, and the rich who own companies that exploit the poor, Marxist literary criticism provides students with a framework for understanding and addressing key concerns in the novel, and linking what they read to present issues of economic disparity. In a society characterized by racially-driven violence and widespread poverty, Lauren finds strength to travel north along the coast of California through writing as she creates a new faith in response to the world around her and pursues a vision of peace during her journey. She notes the racially motivated violence that occurs both within her community and on

her journey, allowing a productive space for postcolonialist and critical race theory-based inquiries.

The future which Butler envisions is also wrought with gender-based violence and tensions, with students paying particular attention to the fact that Lauren decides to disguise herself as a man before embarking on her journey to protect herself. This allows students the opportunity to explore the novel through a feminist lens which students were eager to connect with contemporary forms of gender-based violence. The science-fictional nature of the text encourages the reader to consider racial and environmental problems of the present through the dystopian consequences of the future Butler envisions, and it is through explicit interactions with race and consequence that Butler's text both offer alternative perspectives and empowers the reader to find strength within themselves and change the communities in which they live for the better. Making clear connections between the conditions in which Butler wrote and the present through historicism and biographical criticism, and by understanding that their contemporary experiences impact their reading of the novel through new historicism, students were able to fully understand the implications reading SF can have on how they envision problems of the present. In the rest of the chapter, I explore students' experiences of CT lenses in conjunction with the novel and other supporting resources in more detail.

Feminist literary criticism. I introduced all six CT lenses used in the study through essential questions, concerns and critical assumptions, and a 'what to do' section on how to apply the theoretical lens to a text, adapted from a teaching resource developed by Deborah Appleman (2015) from her text on teaching CT (see appendix L for borrowed resources). The essential question of gender or feminist literary criticism encouraged students to ask the following: "How does this text reinforce, critique, or challenge definitions of masculinity or femininity?" The

following steps to apply feminist literary criticism were provided (see appendix M for accompanying handout):

1. Consider the gender of the author, the reader, and the characters/voice in the text: How does the text reflect social gender codes?;
2. Ask how the text reinforces or undermines gender stereotypes;
3. Imagine yourself as someone of another gender reading this work. (p. 18)

Before applying this CT lens to the novel *Parable of the Sower*, students were shown a video of a slam poem called “Pocket-Sized Feminism” by Blythe Baird (2016) and asked to apply the lens to the poem. The poem involves Baird reflecting on and problematizing her own hesitance to be overtly feminist, as she ‘saves’ her feminism for spaces she knows it is welcome. She also addresses gender-based violence, and her own failure to report sexual assault. This poem is informed by her experience of gender norms, as she problematizes how she is encouraged to employ various strategies to protect herself from assault while her male counterparts are told to ‘go out and play.’

Students were asked to apply feminist literary criticism to the video through a class discussion, and I began the conversation by requesting general comments. One student quickly stated the following: “I wasn’t aware of all the things I do to protect myself when I go out as being because of my gender. Like, do the guys have to do anything to protect themselves when they’re out at night?” Picking up this thread of conversation, I asked the female students in the class what kinds of things they do to protect themselves when they go out. I received some of the following responses:

I never go out alone.

I stay on main streets with lots of lights.

My Dad told me to walk with my keys in my hand, and my mom told me to act like I'm on the phone.

I don't go out at night, I'm not allowed. But my brothers go out all the time.

I always call my friends when I get home.

Male students in the class were quick to address these claims, with one student noting that he always calls his friends when he gets home. “But you don’t have to,” the female student who began the conversation noted, “We have to because there’s a chance we might not *get* home.” This conversation mirrored Appleman’s observation regarding the many manifestations of feminist literary criticism:

There are at least four dimensions in which using feminist/gender theory can transform students’ reading – how students view female characters and appraise the author’s stance toward those characters, how students evaluate the significance of the gender of the author in terms of its influence on a particular literary work, how students interpret whole texts within a feminist framework, and finally, and perhaps most importantly, how students read the gendered patterns in the world. (p. 71)

Given an explicit opportunity to apply feminist literary criticism to their own lives, students were eager to discuss how their experiences vary along lines of gender. As the conversation around this slam poem continued, male students were quick to note that “not all guys are like this,” opening up a conversation about whether men can be feminists and allies in supporting women experiencing gender-based violence. One male student made a significant observation in this regard: “Well, maybe she wouldn’t have been afraid to report her assaults if, you know, more people supported her. Like, her girl and guy friends...maybe no one told her it wasn’t her fault.”

Having applied feminist literary criticism to their own experiences and to the slam poem “Pocket-sized Feminism,” students were then asked to turn the theory to the novel they were reading, and to consider how gender impacts the characters in the novel, and how their own gender might inform their reading of the text.

Students were less eager to apply the feminist lens to the text, and were thus given the following prompt: “What does Lauren do to prepare for leaving her community and starting her journey North?” Students returned to the text, identifying the things she packs to prepare for her travels and what she steals from her family’s burnt down house before leaving. They noted how Lauren stole her brother’s clothing, and I encouraged them to ask themselves why she insisted on disguising herself as a man and how her experience might relate to the slam poem we watched. One student made the following observation: “Well, I guess she feels more safe traveling as a guy. But it’s weird, because you’d think things were getting better for women, but it’s even more dangerous for them in the future.” Once the discussion began, students were more confident in sharing their opinions and noted the subtler manifestations of gendered stereotypes and societal expectations in the novel. In doing so, students began “[attending] to the cultural imprint of patriarchy” as they read (Appleman, 2015, p. 70).

Social-class/Marxist literary criticism. The primary question students were provided to support their use of social-class/Marxist literary criticism was: “How does this text comment on or represent class conflict?” Use of this CT lens as a teaching tool thus necessarily requires students are familiar with the concept of class. Regarding Marxist literary criticism, Appleman by extension suggests that “teachers can use the lens of social class to help bring into greater visibility the issues of power, class, ideology, and resistance that are embedded in the texts they read with their

students” (p. 58). As a result, teaching Marxist literary criticism came with the need to teach students about power, ideology, and resistance as well.

In order to teach students about class and the inequitable distribution of money and power across lines of gender, disability, race, and sexual orientation, I adapted the introduction of Tim McCaskell’s video “Neoliberalism as a Water Balloon” (2010) (see appendix N adapted image). In this video, McCaskell uses triangles divided by 4 horizontal lines to represent various levels of income which he likens to job quality, with the bottom line representing the poverty line and the top of the triangle representing ‘excellent jobs’ with pensions, benefits and high salaries. He then uses vertical lines to illustrate how these jobs are distributed based on gender, disability, race, and sexual orientation versus ideal job distribution within the class system. He suggests the class system unfairly favours those who have already found success, and makes social mobility for historically marginalized groups nearly impossible. While ultimately McCaskell is critiquing the class system itself and proposes a complete overhaul of capitalist and neoliberal agendas and systems, the introduction to his video was a valuable resource in teaching students about class, how it factors into the uneven distribution of power, and ultimately why various forms of CT matter in encouraging conversations about equity.

When asked what they think class is, students offered definitions such as social and economic division, linked the word class to classification, and noted the hierarchical nature of the class system. The concept of the poverty line was relatively new to students, but they were eager to discuss the consequences of living under the poverty line such as homelessness and drug abuse. In support of this conversation, I showed students the slam poem “The Drug Dealer’s Daughter” by Siiara Freeman (2014). One of the themes explored in *Parable of the Sower* is the impact of drug use on economically disenfranchised communities, making this video particularly relevant both as

an opportunity for students to practice applying Marxist literary theory to a text and as a way to connect contemporary issues to an SF text. Regarding the challenges in teaching students about social class, Appleman notes that it is “difficult for all of us, and especially for students, to critique and resist the prevailing ideology as we participate in it” (p. 65). Given the socio-economic circumstance of a majority of students in these classes, with many students identifying as being from upper-middle class communities, students struggled to conceptualize that class problems are Canadian problems too, with a few students asking throughout the discussion variations on the question “Is it really that bad in Canada?” As a result of these inquiries, many students wrote their final assignments on issues of homelessness, drug abuse as linked to economic inequality, and struggles to access necessary resources such as food and water.

The above-mentioned issues are a significant part of what connects *Parable of the Sower* to contemporary contexts. In the novel class issues are a widely explored theme, and students struggled to see how in a lower-middle class circumstance the main character Lauren might be fortunate purely because of her relative security and access to food and water at the beginning of the novel. Appleman notes the significance of Marxist literary theory in helping students reconceptualize issues of class in a text, stating:

For students to be able to understand themselves and each other, they need to be able to contextualize their knowledge in terms larger than themselves; in other words, they need to be able to place their own particular situations and the texts they read into a large system or set of beliefs. It is for precisely this reason that the particular lens of social class can be useful. (p. 55)

Through Marxist literary theory, students were able to acknowledge their own privilege by reflecting on how they perceived various circumstances characters found themselves in within the novel. With practice, students were able to identify which characters or groups had power in the novel, and paid particular attention to how economically disadvantaged communities were being exploited by those with economic power. Regarding class conflict in the novel, one student made the following observation: “It really seems that this future is a lot like the present, because it’s really hard to get to the top if you aren’t already there today as well. It’s just more obvious in the novel.” Through explicit questioning and application of Marxist literary theory, students were able to appreciate how *Parable of the Sower* can help readers reflect on contemporary circumstances and envision the consequences of deepening economic inequality.

Post-colonialism. Octavia Butler establishes a strong link between issues of class and racialized conflict in *Parable of the Sower* that makes postcolonialist theory a powerful tool in forging conceptual connections between the present and the science fictional future in the novel. Additionally, the need for postcolonial pedagogy and reading practices is a common thread in contemporary scholarship on language arts education at the secondary level. In spite of an established push in the Ontario curriculum to include a diverse range of texts that allow students to understand and appreciate many different perspectives, Wisam Kh. Abdul-Jabbar (2015) in “The Rise of the Unsaid: Spaces in Teaching Postcolonial Literature” explores other reasons why teachers remain loyal to the canon, noting that many teachers continue to teach texts from the canon that reinforce often exclusionary voices in literature. In his study, Abdul-Jabbar considers why teachers are hesitant to include postcolonial literature in their English classrooms: “[there’s a] sense of crippling anxiety on the part of the teachers about teaching postcolonial literature or towards methods of implementing postcolonial theories in the classroom” (p. 222). He argues that

teachers are hesitant to explore literature they are unfamiliar with, and believe their students would also struggle to relate to the perspectives adopted in such texts. However, Abdul-Jabbar ultimately emphasizes the importance of teaching postcolonial literature and other texts which honour the voice of often marginalized groups by defining postcolonial literature as “[...] an invitation to understand the world as we know it now; a world that is fragmented, multicultural and highly politicized,” giving students an opportunity to “[...] examine their own culture in order to realize that theirs is not the center of the world” (p. 226). Appleman (2015) notes similar advantages to teaching postcolonialism, stating that: “Whatever ideologies postcolonial theory might challenge, its most important benefit is that it empowers students to reflect upon their own cultural knowledge as they build interpretations of literature. It thus becomes an essential component of inclusive literary pedagogy” (p. 87).

In *Re-mapping Literary Worlds: Postcolonial Pedagogy in Practice*, a study Ingrid Johnston (2003) conducted in Canada, she acknowledges the following problem: “In most Canadian provinces, even in the twenty-first century, many high school teachers cling to the “old titles”, predominantly British or American literary texts that they feel are “tried and tested” in the classroom, with multiple copies readily available in school stockrooms” (pp. 23-4). She identifies this as such a profound issue because, highlighting the way canonicity functions as a silencing agent, entire groups of people or movements are forced to the margins, limiting the kinds of critical conversations possible in the classroom. The absence of explicit conversations regarding colonialism, postcolonialist content, and postcolonialist methods of interrogating texts noted by Abdul-Jabbar and Johnston similarly impacted this study, as students were largely oblivious to the impact of colonialism in history and were hesitant to discuss issues of race.

I provided students with essential questions, central concerns, critical assumptions and a guide for how to apply postcolonialist theory to texts, adapted from Appleman's work on teaching CT (see appendix O for handout). Students were asked to apply the following question: "How does this text comment on, represent, or repress marginalized voices?" with the objective of identifying "patterns in relationships, class, and power that marginalize individuals who do not identify with the dominant culture, and acknowledge the histories of various power differentials along lines of race, culture, colonization, and prejudice" (Appleman, 2015, p. 19). I began our discussion on postcolonialism by asking students what they knew about colonization and briefly considering the history of colonization in North American contexts, after which one student asked what colonization has to do with racism as seen today. I requested that students keep that question in mind while watching the slam poem "Unforgettable" by Pages Matam, Elizabeth Acevedo and G. Yamazawa (2014). In this poem, the poets reflect on the names their parents gave them in an effort to hide their cultural heritage, and their hopes of regaining a sense of cultural identity in the names they give their children. Responding to this poem, one student offered the following comment: "I get this poem, because I'm from a culture where people think white sounding names will help kids be more successful." Although students were still not eager to discuss race as a class, they were able to apply issues of race to the novel, and many students explored the link between contemporary contexts and the future of the text along racialized lines.

Students were drawn to discuss two overt instances of racism in *Parable of the Sower*. First is the racism Lauren observes within her community where, even though members rely on each other to live, interracial relationships are still the cause of disputes between families. A student made the following observation: "You'd think these problems wouldn't be there when they have so many other things to worry about. But maybe it's because their living situation is so bad, they

go back to the way things were before.” Students also discussed a company town in the novel called Olivar, where poor people move to make company money instead of actual salaries and workers are called ‘21st-century slaves’. A student brought the following quote from the novel into the discussion:

I didn’t argue. There wasn’t much point in my arguing with her. “I doubt that Olivar is looking for families of blacks and Hispanics, anyway,” Dad said. “The Balters or the Garfields or even some of the Dunns might get in, but I don’t think we would. Even if I were trusting enough to put my family into KSF’s hands, they wouldn’t have us.” (Butler, 1993, p. 122)

The student noted that even the worst opportunities were not made available to people of certain races, expanding upon the earlier suggestion that racialized communities were the first to suffer during moments of economic instability. In many students’ final assignments, they connected the novel to contemporary issues through engaging in postcolonialist analysis, covering topics such as the Black Lives Matter movement, distrust of the police and other public institutions, issues of race in prison populations, and inequities in educational opportunities based on students’ race, culture or ethnicity. While many students used postcolonialism to build connections between contemporary contexts and the future in the novel, many also found it useful to discuss Octavia Butler’s possible motivations in writing *Parable of the Sower* as a black woman who wrote in specific historical contexts.

Biographical criticism. The primary question when engaging in biographical criticism involves asking “How does this text reflect the experiences, beliefs, and intentions of its maker(s)?” When engaging in this kind of work, I encouraged students to take the following steps:

1. Research the author's life, and relate the information to the text;
2. Research the author's time – its historical, geographical, political, and intellectual moment- and relate that data to the text;
3. Research the systems of meaning available to the author, and relate those systems to the text. (Appleman, 2015, p. 167)

Proponents of biographical criticism suggest that authors do not write within a vacuum – rather, authors are influenced by a multiplicity of experiences and historical moment in which they are writing. In response to a question in the exit interview regarding whether SF should be taught in schools, one student provided the following response:

[SF] helps me think critically because I wouldn't have looked so deeply before and it makes me think about how authors actually write their novels, "Like hey, maybe they actively have something to say." Also, helps us think about consequences and technology...like maybe we are going too far. The lenses helped me think about that stuff.

Biographical criticism emphasized the constructed nature of texts, not just as fiction but as cultural artifacts and representations of an author's accumulated knowledge, beliefs and experiences.

In order to provide students with practice in considering how an author's biographical history impacts their writing, I showed students G. Yamazawa's poem "Elementary" (2014). In this poem Yamazawa discusses the various things that contributed to who he is as a poet, including his first experience calling someone 'gay' and his father's response, his Buddhism, and how his poetry represents his feelings about the power of words and his relationship with being American. The goal of this activity was to show students that any number of things can play a role in informing an author's work, as an author's possible influences and intentions in writing can help guide them towards critically engaging with texts. Applying this form of CT to the novel *Parable of the Sower*, many students explored Octavia Butler's history as a black woman who lived through the civil

rights movement, experienced segregation, and was subject to various forms of racism and sexism. Every student who engaged in this form of exploration as part of their final assignment in some way noted the importance of context in forming our interpretation of written work, as looking at the author's life and the historical context in which they wrote can provide valuable insight into texts as more than fiction.

Historicism/new historicism. The final CT lens I provided students with was a combination of historicism and new historicism. Similar to biographical criticism, proponents of historicism suggest that “context is important to the meaning of a text, and requires that readers analyze a text along lines of history and culture” (see appendix – own handout). While historical context is important, Appleman (2015) also notes the importance of teaching students to see how history is constructed.

Most of us first encounter history as a certain and trustworthy narrative of past events. Because it is an object of study, and because it has factual roots in the cultures and events that are its subjects, history is believed to be not only accurate but to have explanatory strength as well. We take it to be a record of the thoughts and actions of people present at important moments in time. In many ways, this manner of history constitutes the memory of a society and its culture. (p. 99)

Historical context is a significant tool for interpreting texts, given that literature can represent historical moments and the collective sentiment of individuals, communities, cultures and eras. By extension, new historicism as a CT lens involves readers identifying that their own experiences shape how they interpret history, as within “a larger understanding of the postmodern condition, we have come to see history as changeable, as subject to impression, and, perhaps most

importantly, as a product of the culture that creates it” (Appleman, 2015, p. 100). New Historicism therefore involves students asking themselves, “What are the ways in which our understanding of literature and its historical context change over time?” Thought of in another way, through acknowledging that the novel was written in 1993, how do readers’ experiences of the novel in 2016 differ from the historical contexts the novel was written in?

Before applying these CT lenses to the novel, students were shown Javon Johnson’s slam poem “cuz he’s black” (2013), and what the historical context was surrounding the poem. Students were then asked to consider how their cultural knowledge and experiences over the last three years have shaped their interpretation of the poem. One student was quick to note the following: “Well, it tells us that in 2016 this is still a problem for a lot of people, because I think things have gotten worse since 2013 when he wrote this.” Using historicism and new historicism in conjunction gives students a sense of time passing and distinct interpretations to explore in tandem, allowing students to consider how historical context compares with how they understand a historical era or concept based on their own experiences or new knowledge.

These lenses are particularly useful when exploring SF texts that are not recently published. In exit interviews many students were drawn to the idea of SF as a predictive tool or as a genre where the author anticipates potential consequence of present actions, as can be seen in the following responses:

I think SF is about seeing what our possible future could be like. I guess SF is kind of a predictive tool we can use.

Yes, SF should be taught because it gives us a futuristic view of what could happen.

[SF is about] the future, predicting what will happen.

Yes, [my idea of SF] has changed. It's plausible, it could happen, it is reality. It's just a matter of seeing it, and society moving towards that direction. Like, SF is relative to time. Space travel is SF now, but in 1000 years it won't be.

Especially with near-future SF, students can see how ‘right’ SF authors were in their predictions by using historicism to understanding the author’s context during writing and new historicism to understand how their experience of the text has been impacted by their own experiences and knowledge. While many SF scholars would argue that SF should be celebrated as literature and not merely as a prediction or a thought experiment, the promise reading SF through the lens of historically-oriented critical theories has is supported by Appleman’s observation:

If we understand history to be a cultural product shaped by a society’s beliefs, values, and intentions, then we see that it is not as different from literature as we might at first believe. This means that in our literature classrooms, we are teaching our students to read history along with the texts we assign. (p. 110)

By accessing SF texts through historicism and new historicism, students were able to make critical connections between the past, present and future, where both history and literature are objects of reflection and exploration in pursuit of meaningful change.

Conclusion

Through applying CT lenses to *Parable of the Sower*, students began to make connections between the science fictional future in the text and contemporary issues. Supplemented with an understanding of SF literary devices, students explored SF as a genre that can provide them with valuable insight into the consequences of actions in the present. CT also allowed students to refine their understanding of what it means to engage in critical thinking by adopting various lenses, as students were challenged to explore both SF and non-SF texts through a variety of conceptual

frameworks and perspectives. In the next chapter I will consider in more depth how students benefit from the connection between SF and CT, contributing to a deepened connection between science fictional futures and contemporary issues impacting their lived experiences in present-day contexts.

Chapter Five - Teaching at the Intersection of Science Fiction and Critical Theory

Having explored science fiction and critical theory (CT) as separate areas of inquiry addressed in this study, in this chapter I will discuss how I engaged with SF and CT through an ongoing dialogue between genre and theory. In *Critical Theory and Science Fiction*, Carl Freedman (2000) establishes the following goal:

My aim is not to read science fiction “in the light of” critical theory (itself a suspiciously positivistic metaphor), but to articulate certain *structural* affinities between the two terms. [...] my chief intent is to show that the conjunction of critical theory and science fiction is not fortuitous but fundamental. (p. 23)

Freedman argues that SF has structural similarities to CT which make the genre purposefully critical, as imagining profound difference in fictional futures allows readers an opportunity to see potential change in their own present moment⁴. Freedman notes the struggle SF scholars have had in emphasizing the critical potential of the genre, given that the “philologically based connection between pulp and science fiction retains considerable force to this day, and so continues to obscure the critical vitality of the genre” (p. 90). Discussed in the chapter “Science Fiction Concepts & Pedagogies: Putting SF to Work in the Classroom” earlier in this thesis, tensions between the SF community (academics, authors, fan-based communities) and academic literary culture inform Freedman’s insistence that SF be seen as a potential tool for change even as it is often undervalued as literature. A similar approach to SF is seen in P.L Thomas’ *Science Fiction and Speculative Fiction: Challenging Genres* (2013), where he envisions SF as a pedagogical genre through critical pedagogy and critical literacy, making the following claim:

⁴ This does not mean all SF is inherently critical or without conceptual limitations. For an example of a critique focusing on the exclusionary history of SF, see Isiah Lavender III’s *Race in American Science Fiction* (2011) where Lavender III makes the claim that the potential SF has to envision difference in new and empowering ways is often muted by white, male dominance within the genre.

SF and speculative fiction are ideal genres for confronting the nature of text, genre, medium, and reading, providing students and teachers rich and complex avenues for reading and rereading the world, writing and rewriting the world as well as creating classrooms that honor teacher/student and student/teacher dynamics (Freire, 1993, 1998, 2005). (p. 4)

In this text, Thomas argues that SF is a powerful genre through which the hegemony of the canon may be dismantled by making the claim that SF can be used not only to engage students in literacy practices, but can also contribute to more inclusive and critical classrooms. While I do not propose removing canonized works from the secondary English curriculum in this thesis, I argue that space be made to include an increasingly diverse range of texts and genres. My emphasis on SF and the explicit teaching of CT I engaged in to support students' reading of Octavia Butler's *Parable of the Sower* (1993) is informed by a broader conversation, which both Freedman and Thomas contribute to, regarding how SF's structural and thematic connection to CT and progressive pedagogical practices make the genre a useful resource to envision change that must be acknowledged and utilized in secondary school contexts where canonized texts are still largely dominant.

SF as a Flexible Pedagogical Tool

Jason Ellis in his chapter titled "Revealing Critical Theory's Real-Life Potential to Our Students, the Digital Nomads" from Karen Hellekson, Craig B. Jacobsen, Patrick B. Sharp and Lisa Yaseks' *Practicing Science Fiction: Critical Essays on Writing, Reading and Teaching the Genre* (2010) makes the following observation:

The extrapolative power of science fiction to bridge worlds—the real and the fantastic, the sciences and the arts, the extrapolative and the pragmatic—makes it a significant pedagogical tool in the increasingly technologized twenty-first-century classroom. (p. 37)

Through the process of extrapolation, Ellis identifies that SF is uniquely suited to supporting twenty-first-century learning as SF can assist students in understanding change brought about through advances in scientific inquiry and technological development. Acknowledging the potential SF has to help students explore present-day challenges and change, Ellis attributes this to the breadth of topics the genre considers. In constructing a believable science fictional future, SF authors must take into consideration entire cultures and societies, and a diverse range of conceptual frameworks and topics must be incorporated into the creation of a dynamic world. As a result, Ellis establishes this far-reaching characteristic of SF as a link to CT:

As a hub of various fields of thought and study, science fiction is a literature well suited to safely land our students on the rocky shores of critical theory while simultaneously revealing the importance of theory and its vocabularies to our students' everyday lives—lives that are involved in combat, whether realized or not, with political interests and global capital. (pp. 37-38)

While Ellis observes the broad scope of SF, Freedman (2000) makes the same observation of CT in his *Critical Theory and Science Fiction* where he asserts that CT “is dialectical thought: that is, thought which (in principle) can take nothing less than the totality of the human world or social field for its object” (p. 8). Both SF and CT take widely disparate issues and topics as a general focus, allowing students to address a broad range of subjects. Through the constructed nature of

SF futures and their direct connection to authors' present contexts, using CT to analyze visions of the future can also assist students in understanding their own circumstances. As students engage in critique of the future, so too may they turn that analysis towards the present as they begin making connections between the text and their own present moment. For example, as students use Marxist analysis to critique the economic power large companies have over the disenfranchised in Octavia Butler's *Parable of the Sower*, they might also draw a link between the future Butler imagined and the historical moment which inspired her. In doing so, students can begin to see how theory might help them understand both the SF futures they read about and the present.

Establishing a foundation in SF. In this study, I introduced students to structural characteristics of SF before providing them with CT lenses in order to build a foundation upon which students could expand on their interpretations of various texts. For example, I made sure that students understood how to identify what the significant 'new thing' is in an SF text before asking them to use various critical frameworks to critique science fictional futures. In this way, my use of CT as a pedagogical tool was directly connected to how students could apply CT to SF structural elements such as the novum, extrapolation, and various world building techniques. CT in this way was used as a set of tools students could employ to consider the differences and similarities between the present and the envisioned future, assisting them in learning from SF texts. My use of CT in this context involved students understanding the connection between SF futures and the present, which Freedman (2000) articulates in the following way: "The future is crucial to science fiction not as a specific chronological register, but as a locus of radical *alterity* to the mundane status quo, which is thus estranged and historicized as the concrete past of potential future" (p. 55). Understanding how the reader's present is the historical past in the science fictional

future is a critical element in students being able to learn from SF texts, as our contemporary actions inform the development of author's visions of years, decades, and often centuries to come.

Understanding the temporal relationship between SF texts and the present is a significant contributor to students' ability to apply CT lenses to fictional futures in meaningful ways. As students analyze texts, so too may they analyze the contexts which lead to the creation of science fictional worlds. Particularly with regards to helping students make sense of change in the face of technological and scientific innovation, appreciation of what Istvan Csicsery-Ronay Jr. (2008) in *The Seven Beauties of Science Fiction* calls science fictionality also assists students in meaningfully applying CT to SF and analyzing change and alterity. Science fictionality is the term Csicsery-Ronay Jr. uses to describe the phenomena of the present being perceived as SF due to the speed of change and innovation. In establishing a foundation in SF and ensuring students understand the complex temporal relationship between SF texts and science fictional concepts, students are better equipped to use CT frameworks to analyze the fictional future of SF and their own increasingly complex, ever-changing present contexts. Having made the suggestion that SF and CT have common characteristics which make their conceptual pairing a significant pedagogical tool, in the following section I will go into more detail regarding the structural characteristics of SF that make the genre particularly useful in supporting the development of critical thinking skills.

Explicit connections to critical thinking. The primary argument underlying the approach I took in this study is the suggestion that SF has structural characteristics which are naturally suited to promoting critical thinking in students. It is through the automatic comparison readers make between the present and the fictional future depicted where critical thinking can occur, as the reader is encouraged to ask a variety of questions: How is this future different from the present? Is it

better or worse? Why do I feel that way? What can I learn from the future shown? Is this really possible? If so, how can we avoid it? How might this future become reality? As a teaching tool, SF is most useful when these questions students might be asking themselves while they read are explicitly addressed, and students are encouraged to interrogate their own interpretations of SF futures, to embrace the parts of these futures they might not understand or recognize, and to turn what they learn about envisioned futures back to the present and consider what they might learn from the texts they read. While this is the hope educators have for any texts students engage with, it is particularly important with SF that students are pushed to critically consider what they might learn from futures far different from their present.

Apart from the temporal shift in SF texts, the difference between SF futures and the present is largely identified through the *novum* – the new thing that makes all the difference. The *novum* can be an invention, a societal shift, or a world-changing event. The *novum* can take a variety of forms, be it the impact of inequitable distribution of dwindling resources as is the case in Octavia Butler's *Parable of the Sower*, or genetic modification like we see in Paolo Bacigalupi's short story "The People of Sand and Slag" (2004). Encouraging students to identify a *novum* in an SF text assists in the development of critical thinking skills for a few key reasons. First, it forces students to step back and see the 'big picture' as they ask *what* 'makes all the difference.' This involves students identifying causality and consequence within a story, and helps them understand that one invention, event, or change can have extraordinary impact. Second, in identifying the *novum* students must purposefully compare the fictional future with the present and engage directly with alterity. They must identify what aspects of the future make it so different from the present, and assess the impact of this difference. Finally, in identifying and analyzing the *novum* in an SF text, students have to critically consider whether the *novum* makes the future better or

worse than the present – often there is no clear answer to this question and therefore demands a close reading of the text.

SF texts also encourage critical thinking because of the process of world building authors engage in. While novums are the primary sign the world of the text is different from our own time and place, SF authors often imagine new ways of thinking, being, living, and knowing which can be seen in the smallest details of the world they write about. By placing an emphasis on world building, students are encouraged to pay close attention to what they read, and to pick up on subtle details which might impact their understanding of the future in the text. More importantly still is making students aware of extrapolation as a method of world building by asking students to consider how the author's present might have inspired the future they envisioned. By teaching extrapolation as an explicit form of critical thinking, students can begin to see SF texts as not just fiction, but fiction inspired by reality.

Finally, teaching cognitive estrangement as an explicit reading strategy helps students learn from SF texts. Although the most difficult 'literary device' to teach, cognitive estrangement explains why SF texts are important tools for understanding contemporary problems and is therefore worth working through with students. Understanding that SF futures are inspired by the present concerns of the author, cognitive estrangement involves SF texts acting as a middle ground between the reader and often overwhelming contemporary problems. By explicitly teaching cognitive estrangement as a structural element of SF, students are asked to reflect on their own reading practices and to consider the following questions: Why do we read science fiction? What might we learn from it? What is the SF author doing when they write? While of course SF authors write for a variety of reasons and are not necessarily pedagogical in their intent, cognitive

estrangement as a reading process allows students to consider what they might learn from distant and often seemingly foreign futures.

While these structural characteristics assist students in further developing their critical thinking skills because of the comparison between present and future alongside encouraging metacognitive reading practices, CT helps students understand the answers to those questions they might ask themselves while interacting with SF texts. For example, in a novel with heightened racialized tensions such as *Parable of the Sower* students might acknowledge that they want to avoid the depicted future, but engaging in postcolonial analysis might help them understand why Butler envisioned racial tensions as a potential reality in the future of the novel. Biographical criticism, historicism and new historicism can all be used to further students' understanding regarding the context in which the novel was written, and how issues of race in both the author's and the reader's present might inform our understanding of the science fictional future. In the rest of the chapter I will go into greater detail regarding how I encouraged students to use CT as a resource in understanding the critical potential in SF texts.

Applying critical theory to SF texts. Having introduced students to SF literary devices that would help them in understanding how SF texts are constructed, I encouraged students to analyze the future of *Parable of the Sower* through the key questions of each CT lens. Using extrapolation as the foundation for such explorations, CT became the bridge for helping students understand the connection between problems of Butler's fictional future and contemporary issues. Applying various CT lenses to the novel also allowed students to focus on specific themes and issues, facilitating more depth in students' analyses. While I taught SF and CT concepts separately within the design of the unit, I checked for student understanding of CT approaches through direct application to the novel. For example, during the discussion students had regarding feminist

literary criticism inspired by Blythe Baird's slam poem "Pocket-sized Feminism" (2016) students were asked to apply the same kind of critique to *Parable of the Sower* and Lauren's experiences while travelling through dystopic California. Eager to discuss Baird's experience as a woman who has suffered sexual violence and as someone who openly critiques gendered societal expectations, students were challenged to apply similar perspectives to the novel. Making direct connections between two different texts using the same CT approaches ultimately allowed students an opportunity to practice applying and engage in critique. Opportunities for practice using CT in conjunction with both SF and non-SF texts were a significant part of this study, and my effort to balance two big concepts in one academic unit.

Students were introduced to SF structural characteristics through Paolo Bacigalupi's short story "The People of Sand and Slag" in the first half the unit, making this text an additional resource for students to use when practicing applying CT lenses. "The People of Sand and Slag" is largely dystopic from an environmental perspective, as the story takes place on an environmentally decimated Earth and the main characters, genetically modified humans who survive by eating mud and sand, find what is assumed to be the last naturally bred dog running among the acid pits at a mining site. While Bacigalupi is heavy-handed in communicating his environmental concerns through this story, students readily complicated the story through applying various CT lenses to the text. For example, students showed interest in discussing the cosmetic modifications characters engaged in, paying particular attention to an observation one of the characters makes about economic positions determining the kind of modifications people seek out. Students applied Marxist literary criticism to the text, with one student observing that "all of the body modifications [the main characters] get have another purpose, they aren't just for looks like the people from the city get" and another student responding that "they get useful body

modifications because they use it for work”. During this discussion, students related this to how economic positions in contemporary contexts also impact the freedom individuals have to look a certain way, from clothing choice to more advanced and often expensive procedures which only those with excess money can afford. Embedding opportunities for practice applying CT lenses to SF texts before the final assessment within the structure of the unit provided scaffolding for students to expand upon larger concepts, explore questions they have about texts and approaches, and continually build connections between the present and the future.

Given the importance of water scarcity in shaping the future of *Parable of the Sower*, I also showed Edward Burtynsky and Jennifer Baichwals’ documentary “Watermark” (2013) to the students as an additional opportunity to practice applying CT lenses and making connections between contemporary issues and SF texts. Exploring a variety of uses for water ranging from agriculture to tradition, Burtynsky and Baichwal’s documentary allowed students to approach the concept of water from multiple perspectives. Introducing SF and CT concepts and then providing students with opportunities for practice when layering ideas and approaches effectively prepared students for the final assessment, discussed in the final section of this chapter.

Assessment. The final assessment required that students make a connection between *Parable of the Sower* and a contemporary issue or event, in which students must compare the present with the depicted future. This comparison required explicit use of a CT lens and identification of one SF literary device as analytical tools. Students were free to explore any related theme or issue within the novel, as the design of the assessment allowed for inquiry-based learning. A few significant themes or connections can be grouped across many of the final assignments: racial tensions, distrust in public institutions, prison populations, the civil rights movement which inspired Butler’s writing of the novel, and the Black Lives Matter movement; climate change,

water shortages in the novel and in present-day California, privatization of water sources, and inequitable distribution of natural resources; economic divisions and Marxist literary theory related to contemporary phenomena such as the Occupy Wall Street movement; and issues of sexual and gender-related violence in both the novel and contemporary society. By making explicit connections between the future in the novel and present, students effectively used various CT frameworks to better understand contemporary issues many students stated in exit interviews they had not previously considered.

Conclusion

Establishing a foundation in SF and providing students opportunities to practice analyzing texts through SF literary devices and structural elements prior to introducing CT lenses allowed students to build on prior knowledge gradually, so that students were more comfortable with adding CT lenses to their analysis of SF texts. Opportunities for practice with both SF and non-SF texts assisted me in balancing both genre-based analysis and CT, and the joint use of both concepts allowed students to consider in more depth how SF texts might reflect contemporary concerns. By allowing students to engage in independent inquiry, the final assessment was an opportunity for students to consider how the dialogue between genre and theory can support their exploration of a contemporary issue in an area of interest. By approaching both SF and CT concepts in this way, and through embedding opportunities for practice throughout the unit, students were able to more fully explore different ways of thinking. In providing students with varied opportunities to apply SF and CT approaches, students began to consider how these methods of inquiry might be applied to all media they interact with, even beyond the classroom.

Chapter Six - Beyond Orwell, Huxley, and Bradbury: Critical Uses for SF in Contemporary Classrooms

During this study, students were reminded consistently that their opinions on all aspects of their learning experience were valuable, which served to encourage students to engage in ongoing critique throughout the unit. Particular emphasis was placed on their role as research participants contributing to resources which would be developed to support educators interested in using science fiction (SF) texts in their English classrooms. As a result, many of the suggestions in this chapter come directly from feedback participants provided regarding parts of the study they enjoyed, clarity of concepts discussed, and hopes for future learning in SF and critical theory (CT). In this chapter I will also compare students' answers in their introductory questionnaires with their comments in the exit interviews, and will draw from these responses to track students' learning in three major areas: SF, CT, and critical thinking and contemporary connections. I will also consider their final writing assessment, and will explore the impact an inquiry-based approach to teaching has on facilitating student engagement in these areas. From the analysis of this data I will make suggestions for teaching throughout the chapter for those interested in using SF and CT as pedagogical tools to support the acquisition and further development of critical thinking skills.

Science Fiction

Given the increasing popularity of the genre in non-print media, students were initially eager to share their experiences with SF and enjoyed attempting to define the genre more than I had anticipated. The introductory questionnaire students filled out (see appendix) was helpful in understanding the initial comfort students showed with the genre, as it contained questions where students were asked to specify SF 'texts' they have engaged with both in and out of school. While

out of 47 respondents who returned their questionnaires only 30 students stated they had read or otherwise considered an SF text in school, every respondent cited multiple examples of what they considered SF in their out-of-school response. It is also worth noting for this particular study that half of the students had read Margaret Atwood's *Oryx and Crake* (2003) the previous year for grade 11 English, although upon consultation with their teacher the novel was not approached from a genre-oriented perspective. In response to the in-school SF question, students largely cited the same texts: Suzanne Collins' *The Hunger Games* (2008), Lois Lowry's *The Giver* (1993), and Ray Bradbury's short story "The Veldt" (1950). Many students also noted that they did not focus on the genre in studying these texts. In contrast, student responses for SF texts outside of school varied widely and included novels, short stories, movies, TV shows and series, and video games. In spite of generally limited academic experience with the genre, participants' experience with SF texts in their lives beyond the classroom also explains why over half of all participants rated their knowledge of SF as 7 out of 10 or higher, or 'very knowledgeable,' on the questionnaire. Knowing students' voluntary experience with the genre was useful in helping me introduce SF from an academic, critical perspective. The questionnaire was in this way a fruitful assessment for learning activity, and informed the initial examples I used when introducing elements of SF to students. Because of the popularity of the genre, beginning a unit on SF by discussing students' favourite texts is also a good approach to ensure student engagement even as they learn about unfamiliar and challenging concepts.

Defining SF. In response to the question 'What do you think science fiction is?', I established a few common patterns. First, students valued the scientific basis of SF texts and, as a result, many of their definitions alluded to hard SF texts (SF stories influenced by biology, chemistry and physics) more so than soft SF texts (those influenced by psychology, sociology, and

political science)⁵. This was also illustrated by the tropes many students referenced in their definitions, including time travel, space exploration, robots, artificial intelligence, genetic experiments, virtual reality and aliens. Second, almost all responses referenced the futuristic nature of SF texts. Last, and the area where most growth in students' understanding of the genre occurred, was the belief that SF futures are entirely removed from contemporary society. The following answers are examples of such attempts at definition:

It is the made-up version of any field of science.

[SF stories] are scientific stories completely made-up.

Science fiction is a genre of events that are usually pretty unrealistic in life to occur and can be explained with science.

I think science fiction is a genre based upon a foundation that seems scientific or factual, but in reality does not exist or is not possible.

I like to think science fiction is a kind of fiction in an unrealistic world.

A genre where the material one is reading/writing/watching might not be real at the given point in time.

The conceptual distance students emphasized between SF futures and contemporary contexts was therefore a significant area of growth for students throughout the study, as explicit efforts were made to illustrate how authors are often inspired by their own historical moment and use the process of extrapolation to envision science fictional futures. Given the rigid definitions many students used to describe SF, efforts were made to help students expand on their definitions of SF, and to begin making contemporary connections.

⁵ The distinction between 'hard SF' and 'soft SF' is prevalent within SF scholarship but is not universally agreed upon as Gary Westfahl observes in his contribution to *A Companion to Science Fiction* titled "Hard Science Fiction" (2008, pp. 195-198). However, Westfahl does note that the terms have been useful for reviewers and commentators wishing to categorize stories. The hard/soft distinction, although not a significant aspect of my approach to teaching SF, was useful in this way as a pedagogical concept which I used to expand students' views of what texts might be considered SF given that many students focused on SF texts rooted in the natural sciences.

Connecting the present to the future. Throughout the unit, students were asked how specific SF texts might relate to contemporary events, issues, and experiences, and were encouraged to use SF literary devices to build upon the relationship between the present and SF futures. Returning continually to how SF might be a useful tool for understanding change and consequence within society can help students expand on what they characterize as science fiction as they move towards adopting SF as a way of thinking about the world around them. Particularly useful in this regard was a lesson on extrapolation, during which students were asked to select one quote from *Parable of the Sower* they believe is in dialogue with a contemporary event or that relates to an issue in the present. Through encouraging students to engage directly with the text and challenge themselves to make connections between the fictional future and the present, students began to understand how SF can be used to explore existing concerns.

As a result of the emphasis on using SF as a tool to understand the present, students in their exit interviews expressed a broadened understanding of what SF might encompass, and implications for exploring the genre critically. The following are responses when asked if their definition of SF had changed from the beginning of the unit:

I have the same sense of the genre [as I did before], but now I use it to compare the future with the present.

SF is obviously fiction, but its more realistic. It's not fantasy though, it's possible. It explores future concepts in a negative sense too, a warning. It's a variety of things.

I think it's more like I've become more aware. Usually you think of aliens and technology...but really it's just futuristic, not always science.

Yeah, a lot. I thought I knew what SF was. Now, it's more like inspired by the present. Less fictional, I thought it was more fantasy.

Before I thought it was all futuristic, no connection to the present. Now I see it is connected, not just random.

Yeah, I used to think SF couldn't happen. Now I see it's predictions of the future but it doesn't have to be so absurd. Not just Star Trek and Star Wars.

Before I thought it was entertainment, now it's more about the future, and bigger possibilities open up for different kinds of thinking.

My idea of SF was really influenced by Star Wars and Star Trek. But now I see Ray Bradbury, Hunger Games...It's a wide reaching genre that isn't just about space travel.

Throughout the unit, students were given the critical tools necessary to explore genre beyond common tropes or merely through examples, and as a result many participants embedded in their definitions how SF could contribute to their thinking. In this way, the written assessment at the end of the unit was an opportunity to apply what they had learned throughout the unit about SF by not only exploring *Parable of the Sower* in more depth, but also by using the novel to exploration their own contemporary concerns.

Assessment responses. Part of the written assessment assigned to students involved explicit use of one SF literary device. Of the 49 written assessments analyzed, 27 students made overt reference to their use of a SF literary device as an analytical tool – 12 students identified novums as their primary form of analysis, 4 students discussed cognitive estrangement as a reading strategy, and 11 students discussed extrapolation as a way to understand the construction of an SF text. 22 students did not overtly reference one of the structural elements of SF, however most students followed a similar pattern regardless of their approach to the written assessment. In forming their opinion of the novel *Parable of the Sower*, typically students first identified a novum and based the contemporary connections they made to the text on what they thought was the central ‘new thing’ in the story, the invention, event or societal shift that they believed made the novel’s reality different from that of their own. Participants then used extrapolation or cognitive estrangement to varying degrees of effectiveness and clarity, either to consider what contemporary

realities might have inspired the future of the novel, or to explore through similarities and differences what the novel teaches them about the present.

Gaps in knowledge. The written assessments were particularly useful in exposing gaps in student learning with regards to the SF literary devices. While students could easily identify elements of the novel's future that were different from their present contexts, few students identified why they selected the novums they did. The novum is supposed to be one of the major differences in a SF story that impacts most other aspects of the characters' reality. Identifying the consequence of the novum is what helps differentiate novums from aesthetic differences authors use to provide readers with a general sense of wonder, or the feeling of authentic disconnect from the present. Providing students with opportunities to practice identifying and exploring novums would help students in understanding consequence in SF texts, and would also help to clarify how this device can be effectively used to analyze SF narratives.

Many students, particularly those who used extrapolation alongside biographical criticism, historicism, or new historicism, identified that authors often have clear influences linked to their contemporaneous contexts when constructing science fictional futures. However, when engaging in analysis through explicit connections to the present a large majority of students used extrapolation and cognitive estrangement as interchangeable terms. Extrapolation involves identifying the realities of the author, either direct connections or historical sentiments, and considering how their present influenced the creation of the future in the SF text. In particular, extrapolation helps readers consider how science fictional futures can shed light on contemporary concerns. Cognitive estrangement serves a different purpose, as it can be used as an analytical tool to help students to consider how they might learn from SF texts by viewing depicted futures as an image of the present at a distance. Extrapolation is a linear analytical tool, while cognitive

estrangement positions the present and the future side by side. While almost all students engaged in meaningful inquiry by making connections between *Parable of the Sower* and the present in some way, further clarification in the differences between extrapolation and cognitive estrangement would help students explore their own reading process and understand what they might learn from SF texts in a more purposeful manner.

Opportunities for practice. Limited time constraints in this study reduced the amount of instructional time spent on modelling use of the SF literary devices, where interactions with a broad range of SF texts would have helped solidify definitions and uses for structural elements of the genre. The grade 12 portion of this study was also limited to print SF texts, so there remains an opportunity to see how other mediums with science fictional content such as visual art, movies, music and video games might help support students' deepened understanding of structural elements of the genre. The following suggestions made by students during exit interviews serve to illustrate room for growth within the design of a unit on SF and genre theory:

I would have liked more writing about it, and practice applying the ideas. Keep same discussions though, hearing other peoples' opinions helped.

Maybe a different novel, or give us options. Let us research books and let us choose.

Do hard SF and still look at SF devices, but make it straight forward. And use more contemporary texts.

Keep the way new concepts were introduced, but maybe use more videos and movies.

While each response addresses a different concern or suggestion, the above students illustrate a broader sentiment many participants expressed regarding wanting more opportunities for practice and interactions with a broader range of texts and text forms. A focus on metacognition, particularly encouraging students to track their own thought process as they read SF texts, would

also assist students in exploring how different genres might encourage different ways of thinking. Using a broad range of SF texts would help students in identifying patterns in their thinking across the genre. Opportunities for practice were emphasized as important for students, a common thread when reflecting on their experiences with both SF and CT concepts within the unit. In the following section I will make suggestions for teaching CT in conjunction with SF based on the analysis of participants' questionnaires, interviews and writing assignments, with a particular emphasis on how to refine students' use of CT lenses as analytical tools.

Critical Theory

CT was conceptually positioned in this unit to support students in further developing their critical thinking skills, and to assist them in refining what they mean when they refer to critical thinking. CT lenses were therefore introduced as tools students could use to explore a variety of texts, historical moments, and contemporary phenomena. The decision to emphasize the connection between CT and critical thinking as a pedagogical approach was informed by Deborah Appleman's (2015) observations about student fears regarding the word 'theory' – while students might not have a clear idea about exactly what critical thinking entails, they are familiar and generally comfortable with the term. In this way, critical thinking was a useful concept I could use to frame the idea of CT for students in a risk-free way, where lenses were approached as ways of thinking critically and as sets of questions students could ask of various texts. As a result, while students weren't explicitly asked about CT in either the introductory questionnaire or the exit interview, students discussed CT either implicitly or explicitly when exploring how their idea of critical thinking had changed throughout the unit. The following are participant responses that reference their experience with CT when asked how their idea of critical thinking had changed:

I didn't know critical theory and how to analyze from different points of view [before].

Critical thinking is thinking about thinking, like deciding what tools to use to solve a problem.

Critical thinking before was just thinking critically. Now it's more taking a text and looking at it in specific ways. Asking specific questions. But now I think critically more than I thought before.

I think that I found out about different lenses and focusing instead of roaming aimlessly through a text. It's about defiance instead of escapism. I think about books now in a different way, I'm more aware.

Responses like the ones above suggest that CT can be used to help students envision critical thinking as a more purposeful process, where there are many different perspectives one can inhabit when engaging in analysis.

Challenges with critical theory. Similar to students' experience with SF literary devices and related concepts, students expressed a desire for more practice applying CT lenses. The following responses address suggestions students might have for future units on SF and critical thinking made during exit interviews:

Help us make more connections, the critical theory stuff was hard.

More practice writing and practicing with the lenses. I loved the handouts and the suggestions for questions to ask myself, but I think more practice applying the lenses would have really helped.

Students expressed a desire for more opportunities to write and closely analyze various texts when discussing both SF and CT, although students showed less comfort in applying CT lenses to *Parable of the Sower* than analyzing SF literary devices. The need for more opportunities to practice is also obvious in students' varying comfort levels applying different CT lenses in their written assessments.

Assessment responses. Of the 49 opinion pieces analyzed, 40 students explicitly referenced a CT lens they used to analyze contemporary connections to *Parable of the Sower*. Social class or Marxist literary criticism lens was by far the most popular, with 18 students discussing various elements of economic inequality within the text as it relates to contemporary concerns. 13 students used historicism or new historicism to either explore Butler's direct influences in writing the novel or to consider how their own historical moment influenced their understanding of the text, and 5 students used biographical criticism to explore how Butler's experiences as a black, female author influenced her writing. 3 students used feminist literary criticism, and only 1 student explicitly referenced postcolonialism as an analytical approach. The 9 students who did not reference a specific CT used a mixture of CT lenses to explore the text with varying levels of clarity.

While students were given an opportunity to apply lenses to non-SF texts and then connected lenses to various issues within the novel during in-class discussions, students were not given any explicit connections between CT, the novel, and contemporary issues. Adopting an inquiry-based approach to analysis, participants were expected to select the CT lens they thought best fit their analysis of the connections they were making between the future in the novel and the present. As a result, the clarity of students' arguments often depended on the issue they wanted to address and the critical tools made available to them. For example, students who wanted to address environmental issues in the text were limited to the historicism/new historicism approach within the confines of what was taught when exploring how the novel relates to contemporary concerns regarding climate change, water shortage and rising sea levels. Because I introduced CT through an analysis of class and the inequitable distribution of fulfilling and sustainable job opportunities, students who focused on Marxist literary theory had more of a foundation for their arguments.

Certain students were therefore in a better position to analyze the text if their interests could be easily analyzed by one of the discussed lenses. This issue can be addressed in two ways depending on the scope of the unit: first, students can be given more CT lenses and some guidance regarding possible topics to explore or second, students can be given less lenses to choose from but can be given extensive practice applying these approaches to various issues and texts. Limited time spent teaching CT approaches ultimately meant that students' use of lenses sometimes came across in written assignments as an afterthought instead of a fundamental aspect of their thinking about the text.

Impacts of critical theory on literacy practices. In spite of the use of lenses in some cases seeming peripheral to students' analysis, using CT in conjunction with SF texts helped students to normalize interrogating a text, as students began to acknowledge that texts are constructed by authors with influences, biases, and intentions in writing. CT approaches also allowed students to inhabit multiple perspectives, and to read with purpose through guiding questions. While teaching students both a new genre and various CT lenses proved at times difficult to balance conceptually for participants, the benefit of CT on students' critical thinking skills and ability to connect SF futures to contemporary issues remained an important learning opportunity within this study.

Critical Thinking and Contemporary Connections

In the introductory questionnaire students were asked to provide a definition for critical thinking, with the objective of seeing how students viewed their own use of critical thinking. I identified a few common patterns in many of the responses. Many students discussed critical thinking on a superficial level, with critical thinking involving either sharing an opinion or answering a question being asked, as is exemplified in the following responses:

Critical thinking is when you are given a topic and [give] your thoughts on it.

Assessing a situation/issue with the proper mind, and having the ability to form your own opinions.

Using logic before arriving to a conclusion.

Critical thinking is going deeper with what is supposed to be and making more complex connections. An example of critical thinking is answering questions about the novel.

Other students provided ambiguous definitions, similar to the discussion we had in class when students consistently referred to ‘thinking outside the box’ without further elaboration:

I think it means to think outside of the information that is given.

Thinking beyond what is clearly stated.

Thinking effectively.

Productively thinking about an important topic.

Critical thinking is a deeper knowledge of thinking.

Many students did not provide examples of what critical thinking might look like, or how they use critical thinking in contexts beyond school. While most students attempted defining critical thinking in the questionnaire, only two students discussed the more subversive side of critical thinking that emphasizes questioning:

Critical thinking is thinking or contemplating a topic on a very in depth level, keeping in mind many different factors. It may involve challenging the question or statement that was posed, or attempting to disprove something.

Critical thinking is the ability to ask questions that confuse you to further your understanding. You allow yourself to see further than words on the page. I tend to place myself in the shoes of the main character as to understand the story more.

Participants’ responses suggested that while students were familiar enough with the term to attempt definition, few students exhibited a clear understanding of what ‘thinking outside the box’ might

entail, and fewer consciously acknowledged use of critical thinking in how they understand the world or interact with various forms of media.

Curriculum connections to critical thinking. While *The Ontario Curriculum for English* (2007) emphasizes the importance of critical literacy and critical thinking, how to teach critical thinking is left up to the discretion of the teacher with little practical guidance. This might in part explain why students' definitions of critical thinking are ambiguous, as teachers are required to decide independently how to approach the concept. It is because of the wide-reaching definition provided in *The Ontario Curriculum for English* where critical thinking is considered a set of tools that help students “[think] about ideas or situations in order to understand them fully, identify their implications, and/or make a judgment about what is sensible to believe or do” that I decided to teach critical thinking not as a concrete concept, but as a set of approaches to questioning a variety of text forms (Ontario Ministry of Education, 2007, p. 207). Students' questionnaire answers informed the refining of a goal in teaching critical thinking, with a two-fold objective: First, to help students develop a clearer understanding of critical thinking and how it might be useful beyond the classroom and second, to provide students with tools in the form of SF literary devices and CT lenses that they could use to inform both academic and personal inquiry.

Critical thinking beyond school. Through the explicit teaching of reading processes and interrogation of texts as critical thinking, students were encouraged to complicate their understanding of what it meant to think critically. In particular, I wanted students to consider the ‘real life’ uses discussed tools might have in helping them to make more informed decisions about their own lives. When asked to redefine critical thinking in their exit interviews or to consider how their definition of critical thinking might have changed, students provided the following observations:

[Critical thinking is] being able to remove a bias, look from multiple perspectives. It applies to real life, gathering info and looking deeper.

[The study] clarified my idea of critical thinking, and broadened what I thought it was. I think it's more about challenging ideas, and provoking thought, et cetera.

Now I think It's still evaluating information or a text or whatever, but it's through different lenses. Not just looking deeper, but in a different way.

I guess it's just more...I didn't know what it was, now I think it's the way you look at things, examine, interpret...What you do with information matters.

In asking students to build on what they believe critical thinking entails, students were able to reflect on their own thinking and expand on the analytical tools at their disposal. Critical thinking for many students became more than searching for answers to questions others asked them, but rather as a way to dig deeper, to adopt multiple perspectives, and to question biases and assumptions. Perhaps most importantly, students identified that critical thinking transcended information gathering – as the student in the final response identified, “What you do with information matters.”

In-class discussions. With regards to contemporary connections, I encouraged students to bring up anything they believed might even peripherally connect to what we were discussing during lessons. Given the timing of the study, students were largely focused on the 2016 American presidential election, with the second and third presidential debates occurring during the study. As *Parable of the Sower* takes place in a near-future California where citizens are apathetic about voting for the next president, students were particularly interested in comparing the issues Butler envisions with contemporary contexts in the United States. While the presidential election provided an excellent opportunity for students to engage in critical analysis of an ongoing contemporary event, empowering students by having them bring in any news during a unit with an emphasis on critical thinking is an effective way to increase student engagement and ensure

students view what they are learning as relevant. Students also reflected on a variety of other contemporary events or issues, including the Syrian refugee crisis, the Black Lives Matter movement, and the Dakota Access Pipeline protests. Although improvised in that students brought in news they thought was interesting or relevant, these in-class discussions heavily informed many of the issues students addressed in their written assignments.

Assessment responses. In *Parable of the Sower*, Octavia Butler uses first-person focalization through fifteen year-old Lauren to introduce the reader to the future of the novel. Lauren suffers from hyperempathy, a disorder caused by her mother's use of designer drugs while pregnant, that makes her especially sensitive to others' pain. Because of her hyperempathy, Lauren learns to protect herself by being especially observant of what goes on around her, preventing surprises wherever possible. As a result of Lauren's characterization, readers are given glimpses into many different aspects of her reality and the reader benefits from Lauren's deeply felt need to understand the world around her. Because Lauren reflects on many different aspects of society within the novel, students can relate *Parable of the Sower* to a variety of contemporary issues and concerns.

One of the expectations of the written assignment was that students had to use the novel to explore a contemporary issue or event. Student responses varied widely based on personal interests, covering the following topics:

- Water shortage and the climate
- Water privatization
- Global warming and rising sea levels
- Climate and agriculture linked to economic inequality
- Shrinking middle class
- Class conflict and contemporary politics
- Class differences/Economic inequality

Illiteracy
 Distrust of institutions (the prison system, police, the fire department, schools, hospitals)
 Slavery and capitalism
 Terrorism
 Gun violence
 Gender inequality
 Teen pregnancy
 Reliance on technology
 Israel and class-driven relief funding
 Racial tensions/Racism
 Contemporary movements (Black Lives Matter, Occupy Wall Street)
 Drug abuse
 Homelessness

By leaving the topic of analysis open through an inquiry-based approach to learning, students were able to engage in research that interested them to support connections they made between the science fictional future and the present. Regarding being able to decide the object of their exploration, one student in the exit interview stated:

I did like being able to take a piece of writing that actually connects to the real world. Something that isn't detached. You get to make your own opinion. [...] I liked being marked on something that brings light to the real world.

While being given limited guidance in selecting a topic proved challenging for some students who required additional scaffolding, most students noted that they enjoyed having class time dedicated to research in an area of interest. Many students also noted the importance they saw in what they were learning, noting that not only did they enjoy exploring topics they cared about but that they also believed what they were learning in class would actually help them in their lives outside of school. Before discussing other observations noted during this study, I will provide examples of students' written responses to illustrate in more depth the kind of thinking this unit helped to facilitate. These excerpts vary in approach and issues addressed, and show the value of using SF and CT in conjunction with an inquiry-based approach to teaching and assessment design.

SF as a warning. While students were asked to analyze one contemporary issue or event, a few students also broadly reflected on how the novel *Parable of the Sower* functioned as a general warning to the reader. These responses involved students either directly or indirectly considering Octavia Butler's intent in writing the novel:

By looking through Butler's perspective, understanding her purpose in writing the text and comparing our world with the story's setting, we can relate the messages of the novel to our own lives and to our understanding of the world around us. [...] Parable of the Sower was written with a clear goal in mind; Butler wanted it to serve as a warning to society, and her point is driven home by the immense contrast between the harsh conditions in the novel and the comfortable lives people lead today.

[...] the present has more in common with the future presented in Parable of the Sower than most would wish to believe, as the issues addressed by Butler in the novel are all problems we face today. The setting was inspired by the extrapolation of what Butler perceived to be important issues in the world around her, as she confirms in the interview included at the end of the text: "The idea in Parable of the Sower [...] is to look at where we are now, what we are doing now, and to consider where some of our current behaviours and unattended problems might take us." (Butler 227)

This future presented in Parable of the Sower is a powerful warning from Octavia Butler that, rather than simply instructing readers to make change, spurs us into action by exploring a world that is both vastly different from and eerily like ours, a world that she believed could become reality if nothing changes.

By considering Butler's goals in writing *Parable of the Sower*, students mirrored conversations in class regarding what and how readers might learn from SF texts. In making explicit connections between the present and the future depicted in the novel, responses suggested that students used this assignment as an opportunity to reflect on the present and the general importance of taking action in meaningful ways to prevent further consequence on a variety of issues.

Climate change and water shortage. One of the most common challenges students discussed as requiring immediate attention in order to avoid the future in which *Parable of the Sower* takes place was that of climate change and, by extension, water shortage. The following are

excerpts from responses where students identify that reading the novel caused them to view the issue of climate change with increasing urgency:

The novel should be used as a warning of what may come, as the author accurately predicts contemporary issues for the creation of a dystopia, through the novum of scarce water supply. Soon, this may no longer be a novum seeing as it is the direction in which society is headed should we continue to waste precious natural resources, or worse, allow corporations to waste them for us.

Approximately 1.1 billion people around the world do not have access to water and by 2025, it is predicted that at the current consumption rate, two-thirds of the world's population may experience water shortages (World Wildlife Fund). Butler included this aspect in her novel to display to the readers that global warming and climate change is an issue that needs to be addressed by society immediately. Acknowledging the fictional future used in the novel and comparing it to the state the world is in now suggests that what is envisioned is closer than we think.

In both responses, students identify that the science fictional future is increasingly less SF and more reality as the climate deteriorates and consequences in the novel become more prevalent in daily life. The following students express similar sentiments as they reflect on how the consequences of climate change in the novel might become reality in the near future:

New historicism and cognitive estrangement allows one to see the repercussions our actions have and how it could lead to that of Parable of the Sower. Our current attitude toward abusing nature could cause us to live in a world where water is no longer a right but a privilege that only the rich can afford.

Society has avoided considering the palpable effects of global warming, refusing to acknowledge the reality of the detrimental future. In Parable of the Sower, Octavia Butler examines how current environmental deterioration could lead to sea level rises as well as the damaging effects it will have on society in the future. Butler uses the novum and extrapolation to create a fascinating dystopian environment which ignites speculation on the contemporary world.

Identifying anticipated issues around water shortage and other effects of climate change in the near future, many students who used this assignment to explore environmental issues criticized the tendency to ignore the impact global warming will have in critical aspects of daily life.

Class disparity and conflict. Another common issue students discussed in their written assessments were various aspects of class disparity and class conflict. In particular, students analyzed the problem of drug abuse through a consideration of class disparity as shown in the example below:

The Los Angeles crack epidemic of the late 80's and 90's obviously influenced Butler's depiction of drug use and the violence around it. Looking at the novel through the lens of new historicism we can see that she is trying to warn us that, if nothing is done to stop this, the damage will be on a much larger scale. The things that are shown in the novel - the violence, robberies, gangs, and prostitution – that occurred because of drugs are not very different from what we see today. [...] By using new historicism, extrapolation, and science fictionality, Butler succeeds in showing the terrible effects of drugs on not only the users but also on families and society. The economy as a whole also suffers due to the cost of repairing the damage, in the novel and in real life. The problem is made worse by the separation of classes and is worst among those who live in poverty. Those who can't live a sustainable lifestyle use drugs to escape, which is also common in our world.

A sense of urgency is also present in this student's analysis, suggesting that reading *Parable of the Sower* assisted them in identifying an issue that requires immediate action. Other students connected the issue of class to contemporary politics, where they identified political consequences of class division and explored how capitalism might compromise democracy:

Contemporary wealth inequality can be seen on national and international levels. This is largely due to inherited wealth and power. 50% of the people on the Forbes 400 list were born into privilege. Those born into wealth have greater opportunities for education, jobs, and face fewer obstacles in pursuing careers that generate more wealth. Therefore those born into lower class families are already at a disadvantage because the economic system is bias to those who already possess the wealth. In Capitalist societies this also translates to political power, especially in the face of democracy. This helps perpetuate wealth inequality.

In the novel the wealthy KSF Corporation and others like it exploit the poorer working class people for their own monetary gain. They use the fear of the dangerous poor on the other side of their walls and the promise of safety to gain the support of the people and ultimately immense power over them. Contemporarily in the U.S. election, Republican candidate Donald Trump employs similar tactics to the corporations in the story. He states that poor refugees from Syria and immigrants from Mexico will cause violence in America. He spreads this fear and then presents himself as a savior for the people.

While the fact that the American presidential election took place during the study undoubtedly impacted what many students chose to focus on in these writing assignments, many students in both written responses such as these examples and during class discussions stated that reading *Parable of the Sower* helped them work through how they felt about the election. Finally, other students used this writing assignment to further explore the broader implications of class disparity in highly differing ways, with one student focusing on the Israeli government's inequitable distribution of repair funding, and the other making suggestions for how the United States should rebuild their economy:

Parable of the Sower is a novel that illustrates the monstrous gap between the poor and the rich and how no one offers the homeless a chance to improve their horrible standard of living. We ignore the poor and invest in the wealthy, just like the Israeli government does, and the private companies in Parable of the Sower. There is no doubt in my mind that one day our world will become Lauren's, a time when we feel we must turn our personal psychological walls into brick and mortar.

Analyzing how the American economy has progressed since the novel was written suggests that Butler's prophecies are definitely within the realm of possibility. The future that Butler created in Parable brings awareness to the consequences of issues such as income inequality and a diminishing middle class, should they be allowed to fester. Analyzing the text today illustrates the alarming reality that society has done very little to prevent a 'Parable-like' future. It rests on the shoulders of policy and thought makers to create reform that reverses these trends. Options are reconstructing the current taxation system and bringing higher paid manufacturing jobs back to national soil. Regardless, immediate action must be taken.

While student responses varied widely, an inquiry-based approach to the written assessment for the unit provided students with an opportunity to take what they learned from the future envisioned in *Parable of the Sower* and apply it to issues that were important to them. Most students in some way expressed that the novel had given them a new sense of urgency to enact positive change in the world regarding contemporary concerns that resonated with them and their own experiences or interests.

Other Observations

In this section I will consider suggestions students made regarding text selection and instructional design. These observations were gathered through students' exit interviews, during which participants were asked what changes they would propose for teachers interested in teaching SF in their own English classrooms. Many suggestions are conflicting, as different students value different aspects of the learning process at the intersection of SF and critical thinking. I will end this section by discussing participants' opinions regarding whether SF should be taught in school, and how they perceived the benefits of science fictional inquiry.

Text choice. While many students stated that they enjoyed *Parable of the Sower*, text choice was the most commented on aspect of the unit when students were asked what changes they might propose for teachers looking to teach SF in the future. A few students suggested students should be given the option to choose their own novels, leaning towards an even more inquiry-driven approach to teaching SF:

*Maybe something farther fetched so there's more to look at with an approach...
"How could this happen with guesses?" More abstract concepts, optional novels
maybe.*

*Maybe options for books. [Parable of the Sower is] very similar to other SF. Not
special. Parable was like The Road...give us something different.*

One option in this regard might be to create an independent study unit with an emphasis on SF so students can select their own texts. In support of these observations, many participants responded by saying how important it is to allow students to explore their own interests in class, exemplified by one student's suggestion to "keep personal interests at the forefront." Given the importance students placed on being able read texts they are interested in the following conflicting observations supports providing options of novels for students:

Have source material not be so dark. Maybe utopias, or at least less dystopian.

I liked the topic of dystopian worlds, it should stay the same. I think the author predicts the American future.

Although it might be a matter of preference, students were torn regarding whether they see value in reading dystopian fiction or not. Some students appreciated the importance of seeing ‘consequence,’ while others believed studying utopian texts might give them answers to the problems contemporary society faces. Similar divisions are seen regarding temporal remove from the present:

Read SF that is written now, more contemporary, more far future too. Start with specific questions and have us analyze the text like that. Go from narrow to broad. Have more connections to the text specifically, and allow us to practice more. More structure. More ongoing assessment and feedback. Smaller assessments, but more of them.

Keep it close to the present, not too far into the future...not the alien version.

Options for reading would give students the opportunity to choose between the two science fictional categories students identified, where they could decide between utopian and dystopian, and near- or far-future texts. A few students also suggested that teachers use hard SF texts and explore the science behind narratives. While allowing students to choose their own texts might help teachers acknowledge individual student wants and needs, providing students with the support they need could prove unwieldy. Given flexibility in text selection, teachers could introduce students to SF through a variety of short stories that cover the above categories students noted before entering into a novel study. Although not explored in the grade 12 portion of this study, teachers might be able to prioritize student interests by using a variety of text forms to engage students in genre-based critical thinking.

Activities and discussions. Students expressed a desire for freedom not only in text selection, but also with regards to their final assessment. In particular, many students found the 2-page limit for the written assignment difficult, limiting their opportunity to draw from a variety of perspectives⁶. It was also suggested that more attention be paid to close reading of the novel being studied. The following response involves both aspects of students' critiques:

I wish we had more discussions about the novel specifically...develop issues together more. I didn't love the format of the final assignment but I liked how we took different views and applied them. Creative freedom and more opportunities to bring in more perspectives would have been nice.

While the 2-page limit for the assessment was put in place to challenge students to be clear and concise in their writing as they draw from disparate analytical tools, close work with the novel might have assisted students in facing this challenge. While opinions regarding the discussion-based approach to the unit were mixed, students expressed a need to more directly connect assessments with classroom experiences including more guided discussions. Students also expressed a desire for more varied activities:

More hands on activities, too much discussion...maybe more group work, collaborating more. More assignments, or opportunities for practicing, like, 'Hey, check out this article.'

I liked how we analyzed the text. Make it less lecture based, smaller activities and small group discussions...maybe some homework assignments to keep us on the ball.

More activities, like acting like the characters in some way. Or thinking about what it would be like if certain things were gone.

⁶ The 2-page limit was not part of my original assessment design, but a suggestion by the teacher who participated in this study. She had been working with her classes previously on being concise in their writing, and wanted this to be an opportunity for them to practice.

In particular, students noted that they enjoyed classes when they engaged directly with the novel, worked collaboratively to explore CT lenses, and were given specific, small homework assignments through which they could extend their exploration of the text. While I maintain that discussion is an important part of drawing from a wide-range of contemporary connections when working with SF texts given students' eagerness to share things they have heard, guided inquiry does support students' efforts to experiment with and practice applying various concepts. For example, students' work with extrapolation was more guided in nature when students had to select a quote directly from the text and explain how they connected it to the concept, and students showed more confidence in their knowledge of the term as a result. Varied pacing, activities, and levels of guidance during inquiry will help all students feel supported as they continue to explore new concepts and approaches through SF texts.

SF in education. When posed the question of whether SF should be taught in school, students noted a variety of benefits they identified based on their experiences within the study. In particular, students were drawn to the idea that SF encourages readers to think about the consequences of their actions:

SF should be taught, because it gets people thinking about the future and our impact.

Yes, SF should be taught because it gives us a futuristic view of what could happen. [...] If you see what the future holds you can see what's happening in the present. There are actually consequences.

I see no problem with SF being used in school. This unit allowed us to connect to the present which was important. [...] I think the future in SF helps us understand the present because its inspired by the present. Helps bring light to issues I never thought of or analyzed before. I will probably think like this when I read books in the future.

Yeah, I think so. I think it's a good and interesting way to talk about issues without just talking about them...that can get boring. But SF makes it more pressing and concerning 'cause you see it happening.

You have to relate SF futures with the present. Comparisons have to happen. It has helped me think critically, I looked at the bigger picture. Helps us in general compare futures with the present, how it could be.

Students emphasized that reading SF has actual implications for how they think about and understand the present. Responses reinforced the importance of consequence in SF texts noted by Farah Mendelsohn in *The Intergalactic Playground* (2009), as students found texts that are believable to be of more significance than those without clear connections to present action. Related to this, students also valued SF for the genre's natural critical bent:

It makes use appreciate what we have more. It made me think of things I wouldn't think of, and helps us get more ideas.

Yeah, for sure. It's one of the most important genres and it actually has relevance. It can be applied to the real world. I can't think of a genre that allows more critical thinking except maybe nonfiction.

Yeah, I think it exposes kids to critical thinking because it pulls from our world...encourages critical thinking and exposes us to important information regarding technology, et cetera.

I personally like the genre so that's a bias, but it stimulates critical thinking and problem solving for sure. It contains dystopian elements a lot, and we have to ask ourselves if we are doing all we can to avoid the future shown. We need to save our planet.

Many students noted that SF made them reflect on their own actions, and helped them think about the world in a variety of ways they had previously not considered. Finally, and perhaps most importantly for teachers interested in facilitating students' interactions with a variety of texts, participants noted that SF should be taught if for no other reason than that they like it:

Yes, because it's much more interesting than novels they usually make us read like classics or whatever.

Yes, because first it does help with critical thinking but also because in general they tend to be more interesting to adolescents. When people are interested they tend to do better and learn more.

Yes, oh my god, it was so much more fun. It was insightful but you also don't do SF in school a lot. More insightful then I thought it would be. Creates a different kind of thinking... [I] never evaluated a piece of writing that way before.

The benefit of teaching students a genre they already voluntarily encounter in their lives outside of school should not be discounted – teaching popular genres follows a general trend in contemporary pedagogical practice which suggests that often the best learning occurs when students are engaged, and through interacting with texts and text forms that students already find intellectually stimulating and entertaining.

Conclusion

Through an analysis of students' responses to the introductory questionnaires they completed, insight offered during exit interviews, and their written assignments, it becomes clear that the best advice on how to proceed in teaching SF and other critically challenging concepts comes from students themselves and their interactions with the genre. Participants enjoyed feeling like the texts they were reading had relevance outside of school, where their inquiries were made from a place of authentic curiosity. By varying the in-class experience of students through a multiplicity of activities and approaches, and through engaging students in a wide range of critical thinking approaches, participants communicated that they saw value in what they were learning. In some instances, students noted that their learning had changed how they approached texts outside of school. While many participants noted an increased need to be given opportunities to practice applying CT lenses to SF texts in way more closely linked to guided inquiry, all students benefited from being given the chance to connect in-school learning with their general interests and concerns. The use of SF in this way facilitated the kind of learning supported by *The Ontario*

Curriculum for English's emphasis on critical thinking and critical literacy, as students were pushed to consider the importance of what they might learn about the 'real world' as they read.

Conclusion

In this thesis the primary problem I address is an identified need for contemporary resources educators can use to support students in developing critical thinking skills in secondary English classrooms. Drawing from my experience as an English teacher and from my ongoing interest in the pedagogical use of science fiction (SF) texts, I designed an original unit and accompanying teaching resources based on the novel *Parable of the Sower* by Octavia Butler (1993) for an in-school study exploring the use of SF in high school contexts. As an educator interested in diversifying the literature students interact with in high school English classrooms, I used critical theory (CT) to further explore how SF can be used to encourage students to critically interrogate both texts and the world around them while adopting a variety of perspectives and honouring the voices of various marginalized others. I facilitated these learning opportunities through scaffolding students' critique of issues of class, race, and gender by making connections between the dystopian future envisioned in the novel and contemporary concerns. The basis for this kind of learning came from an inquiry-based approach, where students were asked to make connections between issues that concerned or resonated with them and the novel. As a result, this thesis and the adjoining study serves a few purposes: First, I offer English teachers resources that will help them meet critical thinking expectations outlined in *The Ontario Curriculum for English* (2007); Second, I provide educators with a comprehensive conceptual primer for those interested in teaching SF and CT; Lastly, by interweaving study results throughout the thesis I provide readers with student feedback alongside suggestions for teaching practice in these areas. Significantly, in this thesis I also contribute to a severely lacking area of SF scholarship by revisiting the use of SF in secondary school contexts seldom discussed since the admittance of SF into the academy in the 1970's and 1980's. The argument that SF is an untapped pedagogical resource is a driving force

in this thesis, as I consistently claim that SF is a valuable tool that can help educators prepare their students for inevitable change in the years to come.

Research Methodology

The belief that students can learn about contemporary issues through the analysis of science fictional futures was a crucial element of my approach to this study, as visions of the future extrapolated from the present contexts of the author provide students with the conceptual distance necessary to feel comfortable in critically interrogating important issues. By analyzing how SF texts are constructed and various genre-specific elements of SF, students are able to adopt science fictional ways of thinking and apply them to contemporary concerns when considering the consequence of actions and the importance of contributing in meaningful ways to the world around them. Given the tenuous relationship between SF and the academy, I also approached this thesis from the perspective that SF needs to be re-envisioned as literature that has a place alongside canonized texts in secondary English classes beyond a few tired and arguably outdated texts. Due to the speed of technological and scientific innovation students have and will continue to partake in throughout their lives, SF is an important conceptual tool educators can use not only to teach students the significance literature can have in how they form thoughts about the world around them, but to also assist students in developing critical thinking skills that will help them respond to change.

Given that this thesis also involves my making the argument that SF needs to be actively included in students' English classroom experiences for these reasons, the in-school study I conducted was supported by an extended literature review where I considered what work had been done on using SF in education to date. As there is a dearth of work in this area, through the in-

school study I sought to explore how SF concepts could be reconceptualized to support contemporary learners. Student feedback from this study supported the suggestions I made throughout this thesis on how to teach SF to meet critical thinking expectations with CT as a supporting teaching resource. Culminating in practical suggestions and the development of teaching resources for educators, the structure of this thesis allowed me to provide an in-depth history of how SF has been used in education, an analysis regarding the potential SF has as a genre used in contemporary educational contexts, and how the concurrent use of SF texts and CT can support students in developing critical thinking skills in a practically-applicable way.

The in-school study portion of this thesis took place in two grade 12 classes in a large Ontario school board with 52 active participants. Through an initial questionnaire, in-class discussions, a written assessment, and exit interviews, students were asked to provide consistent feedback throughout the study regarding their opinions and experiences as learners during the unit. Student input guided many of the suggestions I made, and assisted me in answering my final research question: (c) How does the use of SF and related reading strategies impact students' learning experiences? While I explored SF and CT conceptually through an extended literature review which supported the development of teaching resources I used in this study, student responses assisted me in clarifying how I envision SF being used in secondary school contexts.

Findings

Students' responses regarding their experiences within the study largely supported the arguments I made throughout this thesis, as students were enthusiastic when told they would be reading an SF novel in school. Initial questionnaires confirmed that many students interacted with SF texts outside of school, making the use of the genre a strong way to engage readers who might

have otherwise been reluctant to participate. A genre-based approach to teaching SF proved useful for students who had not previously analyzed an SF text through comparisons with the present, although many students suggested that more practice interacting with a variety of SF texts would have solidified their learning. Using a short story to illustrate how SF concepts can be used to analyze texts was significant in supporting students' explorations of the genre before moving on to critical theory concepts as another way to examine the novel *Parable of the Sower*.

Framing CT as a set of lenses each with significant questions to be asked of the text allowed students to become progressively more comfortable in using CT approaches in consistent analysis. Additionally, teaching SF and CT concepts separately before asking students to apply both modes of thinking allowed students to compartmentalize their learning. While this unit was meant to help me explore the benefit of SF to promote critical thinking skills in high school English classrooms, drawing from non-SF resources initially helped students see the benefit of applying CT approaches to all forms of media along lines of class, gender, race, and history. Once students were comfortable working with the novel as an SF text and applying CT lenses to different forms of media, they began to consider how SF might help them critically understand issues in the present. The combination of SF and CT concepts not only helped students in interrogating real life issues in areas of interest, but also engaged students in higher order thinking where they considered how the structure of SF texts might help them better understand the present.

Through in-class discussions, written assessments, and exit interviews I identified a significant pattern in how students felt throughout the study. During the unit, students felt what they were learning actually had relevance beyond the classroom. Students enjoyed engaging with a genre which they had experience with before the study, and were eager to make connections to issues they were passionate about outside of school. Through an inquiry-based approach to

assessment design, the culminating assignment provided students with an opportunity to further explore a topic of interest. Many students also noted that the unit on SF and CT helped them refine what it means to think critically, with an emphasis on questioning the world around them and identifying the consequences of their actions. In their exit interviews, students also discussed how this unit impacted their interactions with media in their daily lives, encouraging them to question the intentions behind how stories are structured and news is reported. These findings suggest that teaching SF in this way supports the development of students' critical thinking skills in ways that transcend school contexts, and the teaching resources provided will assist educators in building their own units on SF and CT to promote critical thinking skills in their own classrooms.

Opportunities for Future Research

Because this study was unique within SF scholarship, my objective was largely exploratory where I wanted to confirm that SF texts offer unique learning opportunities for students with regards to the acquisition of critical thinking skills. Given that the study was only 3 weeks long, concepts were not explored with the kind of depth and opportunities for practice many students communicated they would have benefited from. Time restraints also impacted the amount of close-reading work that could be done with the text, leaving students largely on their own to apply SF concepts and CT lenses to the novel. Providing a wider range of opportunities for students to apply CT lenses could have helped in supporting students' analyses of the text, as some students struggled to apply both SF concepts and CT approaches in meaningful ways. Because this study was exploratory⁷, a wide range of SF concepts and CT lenses were introduced to students, although

⁷ Length of a unit of SF would be determined by how the genre was approached within the structure of the course. For example, a similar novel study could take 4-6 weeks with a grade 12 University English class. A unit on SF short stories might involve learning the same concepts, but could be shorter depending on opportunities for assessment. Structuring a course with an independent study unit on SF texts might allow for science fictional concepts to be interwoven throughout the unit.

limiting the number of concepts explored might have helped students in engaging in more in-depth analysis regarding the connection between envisioned science fictional futures and the present.

Based on student feedback throughout the study, I would make a few key changes to how the unit was constructed. In the initial instructional design for the unit, students were going to be given an option between reading Octavia Butler's *Parable of the Sower* and Cory Doctorow's *Little Brother* (2008). Many students expressed that they would have liked an option regarding which text they read for their novel study, where providing students with a list of texts might have allowed students to choose novels directed related to contemporary issues they are invested in. Due to time constraints and the fact that the participating classroom teacher had to begin the novel unit prior to the beginning of the study, all students were given the same text. While *Parable of the Sower* connects with a wide range of themes and concerns relevant to contemporary readers, many students also noted they would have liked either reading a text written closer to the present, or one that was more scientifically or technologically oriented. Students also made a few suggestions regarding how lessons were organized, noting that while the in-class discussions were important in their learning they wanted to be held accountable and required to participate through more structured activities when interacting with new concepts.

These observations, noted in more detail in the chapter "Beyond Orwell, Huxley, and Bradbury: Critical Uses for SF in Contemporary Classrooms," identify areas where future research could be conducted. Because research on contemporary uses for SF in secondary English classrooms is relatively non-existent, more research must be done to explore the additional benefits SF can have when developing students' critical thinking skills in more depth. In particular, student response to a variety of SF texts such as far-future novels, hard SF novels with explicit connections to the science curriculum, and utopian visions of the future have yet to be explored in contemporary

classrooms. This was also a small sample of students in a university-stream course, so the use of SF to teach foundational literacy skills for other age groups and skill sets has yet to be fully considered beyond a handful of commonly used texts.

Conclusion: Fictional Futures Informing Contemporary Learning

Critical thinking is an indispensable skill for students in the 21st-century, as scientific and technological innovation continue to reconfigure the way we share and interpret knowledge; making it crucial that students be taught how to respond to inevitable change. In diversifying global contexts, students must also be prepared to critically interrogate how media impacts their lived experiences and learn to advocate for themselves and marginalized others in various social contexts. By teaching SF from a critical perspective and drawing from CT lenses, used in this study to reveal issues of class, race, gender, and the perceived immutability of history, students are encouraged to think critically and to examine the consequences of both their own actions and broader political or societal decisions regarding issues such as climate change and capitalism. Given my goal for this thesis as a contribution to educators' teaching practice in the areas of SF, CT, and critical thinking, the belief that teachers play an important role in empowering their students to make authentic and relevant connections to literature is central in my approach to teaching SF. By envisioning and learning from possible futures through SF, students are given the opportunity to envision change in their own contemporary moment.

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Appendices

APPENDIX A: ENG4U Unit Plan and Lessons

Engaging with the Present by Exploring the Future: Critical Potential of Science Fiction in Education ENG4U Unit Plan

Unit Title: Science Fiction: World Building, Extrapolation and Critical Thinking

Grade: ENG4U, University English Grade 12

Time: 14 Classes (75 minutes each), 17.50 hours

Unit Summary: In this unit, students will explore science fiction as a genre through stylistic devices such as world building and extrapolation to make connections between the futures depicted in texts with contemporary issues in the present. Students will read Octavia Butler’s *Parable of the Sower* and will use science fiction as a literary framework to explore issues raised in the novel including but not limited to the following: environmental issues and climate change, class and economic disparity, race and violence, gender relationships and representations, and media and power. This unit will provide students with a foundation in science fiction studies, through which students will connect texts to various media forms and current issues. This unit will be supported by various strands of critical theory including feminist and Marxist literary criticism, postcolonialism, biographical criticism, and historicism/new historicism, used to encourage students to consider the culturally, historically and socially situated nature of knowledge and understanding. In making explicit connections between science fiction, critical theory and critical thinking, students will be given new tools with which they can critically analyze and question contemporary problems in areas of individual interest. The final assessment in this unit will provide students with an opportunity to compare the future in a science fiction text with media representing contemporary issues, where students will reflect on how problems are discussed and can be critically interrogated from various perspectives. This process will be modelled through the use of the documentary “Watermark” linked to the issues of water shortage in *Parable of the Sower*, and Paulo Bacigalupi’s short story “The People of Sand and Slag”.

Learning Expectations: Overall Expectations

Oral Communication (OC)

- | |
|---|
| <p>1. Listening to Understand: listen in order to understand and respond appropriately in a variety of situations for a variety of purposes.</p> |
|---|

Reading and Literature Studies (RL)

- | |
|---|
| <p>1. Reading for Meaning: read and demonstrate an understanding of a variety of literary, informational, and graphic texts, using a range of strategies to construct meaning;</p> |
|---|

2. **Understanding Form and Style:** recognize a variety of text forms, text features, and stylistic elements and demonstrate understanding of how they help communicate meaning;
3. **Reading with Fluency:** use knowledge of words and cueing systems to read fluently;
4. **Reflecting on Skills and Strategies:** reflect on and identify their strengths as readers, areas for improvement, and the strategies they found most helpful before, during, and after reading

Writing (W)

1. **Developing and Organizing Content:** generate, gather, and organize ideas and information to write for an intended purpose and audience;
3. **Applying Knowledge of Conventions:** use editing, proofreading, and publishing skills and strategies, and knowledge of language conventions, to correct errors, refine expression, and present their work effectively

Media Studies (MS)

1. **Understanding Media Texts:** demonstrate an understanding of a variety of media texts;
2. **Understanding Media Forms, Conventions, and Techniques:** identify some media forms and explain how the conventions and techniques associated with them are used to create meaning;
4. **Reflecting on Skills and Strategies:** reflect on and identify their strengths as media interpreters and creators, areas for improvement, and the strategies they found most helpful in understanding and creating media texts.

Unit Overview

Date	Class	Activity/Lesson Title	Specific Expectations	Assessment	Lesson Outline
Oct 11	1	Introducing the Study / Establishing Expectations & SF overview + introducing novels	RL 1.1	K/U	<ul style="list-style-type: none"> • Learning Focus: SF Genre - Introduce study (overview of minor assent form, signature collecting and questions, questionnaire) [25 minutes] - Establish expectations [10 minutes]

					<ul style="list-style-type: none"> - What have they noticed about the novel so far? [15 minutes] - Unit overview and SF Overview [25 minutes] • Reading due this class: page 149 • Reading due next class: page 166
Oct 12	2	Novums & “The People of Sand and Slag”	OC 1.3, 1.5 RL 1.3, 1.4, 1.6, 3.2	K/U/T/I	<ul style="list-style-type: none"> • Learning Focus: SF Genre - Mini Lesson on Novums [15 minutes] - “The People of Sand and Slag” reading [15 minutes] - Discussion: Novums in “The People of Sand and Slag” and the novels → What ‘new thing’ did they notice that makes the texts different from their own worlds? [15 minutes] - Independent Activity: Picking out quotes that describe novums in the texts - Reading/Work time [25 minutes] • Reading due this class: page 166 • Reading due next class: page 178

Oct 13	3	Cognitive Estrangement & “The People of Sand and Slag”	OC 1.3, 1.5 RL 1.3, 1.4, 1.6, 3.2	K/U/T/I	<ul style="list-style-type: none"> • Learning Focus: SF Genre - Mini Lesson on Cognitive Estrangement & Critical Thinking [20 minutes] - “The People of Sand and Slag” reading [20 minutes] - Discussion about Cognitive Estrangement (How it functions, how it connects to critical thinking, an approach students can take to SF texts) [15 minutes] - Activity: Quote work using cognitive estrangement to link to contemporary events - Reading/Work Time [20 minutes] • Reading due this class: page 178 • Reading due next class: page 195
Oct 14	4	Extrapolation, Science Fictionality & “The People of Sand and Slag” /	OC 1.3, 1.4, 1.5 RL 1.3, 1.4, 1.5, 1.6, 2.1	K/U/T/I	<ul style="list-style-type: none"> • Learning Focus: SF Genre - Mini Lesson on Extrapolation and Science Fictionality [25 minutes] - “The People of Sand and Slag” reading [15 minutes] - Discussion on Extrapolation and World Building, and Science Fictionality as a critical lens [15 minutes] - Activity: Quote Work → picking one quote or section

					<p>of the novel they are reading and linking it to potential contemporary inspiration/issues</p> <ul style="list-style-type: none"> - Reading/Work Time [20 minutes] • Reading due this class: page 195 • Reading due next class: page 224
Weekend (October 15 & 16)					
Oct 17	5	Critical Theory Overview / Reading time / Introducing Written Assignment	RL 1.5, 1.6, 1.8	K/U	<ul style="list-style-type: none"> • Learning Focus: Critical Theory - Mini lesson on Critical Theory & SF [20 minutes] - Introducing Written Assignment [20 minutes] - Free Discussion: Students will be put into groups and asked to come up with discussion questions based on different approaches they could take to the novel [20 minutes] - Reading/Work Time [15 minutes] • Reading due this class: page 224 • Reading due next class: 244
Oct 18	6	Feminist Literary Criticism & Marxist Literary	RL 1.5, 1.6, 1.8	K/U	<ul style="list-style-type: none"> • Learning Focus: Critical Theory

		Criticism / Reading time			<ul style="list-style-type: none"> - Mini Lesson on Feminist Literary Criticism & Marxist Literary Criticism [25 minutes] - Activity: Quote work, using feminist literary criticism and/or Marxist literary criticism to analyze the text [20 minutes] - Reading/Work Time [30 minutes] • Reading due this class: page 244 • Reading due next class: page 257
Oct 19	7	Postcolonialism, Biographical & New Historicism / Reading time	RL 1.5, 1.6, 1.8	K/U	<ul style="list-style-type: none"> • Learning Focus: Critical Theory - Mini Lesson on Postcolonialism, Biographical & New Historicism [20 minutes] - Activity: Quote work, using critical race theory and/or queer theory to analyze the text [20 minutes] - Reading/Work Time [30 minutes] • Reading due this class: page 257 • Reading due next class: page 278
Oct 20	8	<i>Watermark</i> & Discussion	OC 1.2, 1.3, 1.5 RL 1.5,	K/U/T/I	<ul style="list-style-type: none"> • Learning Focus: Consolidation

			1.6, 1.8 MS 1.2, 2.1		<ul style="list-style-type: none"> - Learning goals for documentary/connect to written assignment [10 minutes] - Watch documentary [40 minutes] - Discussion [10 minutes] - Reading/Work Time [15 minutes] • Reading due this class: page 278 • Reading due next class: page 293
Oct 21	9	<i>Watermark & Discussion</i>	OC 1.2, 1.3, 1.5 RL 1.5, 1.6, 1.8 MS 1.2, 2.1	K/U/T/I	<ul style="list-style-type: none"> • Learning Focus: Consolidation - Watch documentary [45 minutes] - Discussion [10 minutes] - Reading/Work Time [20 minutes] • Reading due this class: page 293 • Reading due next class: 314
Weekend (October 22 & 23)					
Oct 24	10	Content review & Discussion	OC 1.2, 1.3, 1.5 RL 1.5, 1.6 MS 1.2, 1.5, 2.1, 4.2	K/U/T/I	<ul style="list-style-type: none"> • Learning Focus: Consolidation - Content review lesson & activity (SF, Critical theory, the novel) [20 minutes] - Q&A [25 minutes]

					<ul style="list-style-type: none"> • Reading due this class: page 314 • Reading due next class: 329 (end)
Oct 25	11	Final Assignments – Work Period	W 1.2, 1.3, 1.4, 1.5, 3.2, 3.7	-	<ul style="list-style-type: none"> • Work Period for students to gather ‘evidence’ to write their written assignments
Oct 26	12	Final assignments – Writing in-class	W 1.2, 1.3, 1.4, 1.5, 3.2, 3.7	C/A	<ul style="list-style-type: none"> • Students write their final assignment in-class using notes and their books (no technology)
Oct 27	13	Discussion for Final Assignments	OC 1.6 RL 1.5, 1.6, 1.8 W 1.2, 1.3, 1.4, 1.5, 3.2, 3.7	C/A	<ul style="list-style-type: none"> • Consolidation - Group discussions supervised by participating teacher where students share their final assignments - Final assignments due this day - Study exit discussion
Oct 28	14	Interviews and data collection		-	<ul style="list-style-type: none"> • Individual exit interviews occur this day

K/U = Knowledge/Understanding T/I: Thinking/Inquiry C = Communication A = Application

Resources

Bacigalupi, P. (2004). “The People of Sand and Slag”. Retrieved from:

<http://windupstories.com/books/pump-six-and-other-stories/people-of-sand-and-slag/>

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ENG4U: Introductory Lesson			
Expectations 1.1 read a variety of student- and teacher-selected texts from diverse cultures and historical periods.	Materials <ul style="list-style-type: none"> · Study paperwork: minor assent forms, questionnaire · Unit overview and SF overview handouts · Board & writing utensil for daily schedule and expectations 		
Before: Minds On	<ul style="list-style-type: none"> · Introduce study: Introduce myself (name, background, what I do) Work through minor assent form Collect forms and answer questions Distribute questionnaires [25 minutes] Establish reciprocal expectations (what I expect from them as a researcher, what they expect from me as a visitor in their classroom) [10 minutes] 		Assessment Opportunities Assessment <i>as</i> learning: Although not used for marks, the questionnaire at the beginning of the study allows students to reflect on their experiences with SF as a genre in various capacities.
During: Action!	<ul style="list-style-type: none"> · What have they noticed in the novel so far? (Observations, questions) [10 minute] · Unit overview: What this study will actually look like as a learning experience for these students [10 minutes] · SF overview: What do I mean when I say ‘science fiction’ and how does this relate to critical thinking? [15 minutes] 	Differentiated Instruction: Opportunity for students to tell me how they want to learn, and what would help them succeed during the study; Handouts for visual learning alongside verbal instruction;	
After: Consolidation & Connection	Discuss how the reading schedule will work and final questions. [5 minutes]		
Next Steps	<ul style="list-style-type: none"> • Reading due this class: page 149 • Reading due next class: page 166 		

ENG4U Lesson 1: Novums			
<p>Expectations</p> <p>OC 1.3 select and use the most appropriate listening comprehension strategies before, during, and after listening to understand oral texts, including complex and challenging texts; 1.5 develop and explain interpretations of oral texts, including complex and challenging texts, using evidence from the text and the oral and visual cues used in it insightfully to support their interpretations;</p> <p>RL 1.3 identify the most important ideas and supporting details in texts, including complex and challenging texts; 1.4 make and explain inferences of increasing subtlety and insight about texts, including complex and challenging texts, supporting their explanations with well-chosen stated and implied ideas from the texts; 1.6 analyse texts in terms of the Information, ideas, issues, or themes they explore, examining how various aspects of the texts contribute to the presentation or development of these elements; 3.2 use decoding strategies effectively to read and understand unfamiliar words, including words of increasing difficulty.</p>		<p>Materials</p> <ul style="list-style-type: none"> · Novums handout · “The People of Sand and Slag” story · Highlighters, pens, etc. for interactions with the text · Discussion questions · Computer & Projector to connect to own website with ‘independent activity’ options · Reading Schedule for board 	
Before: Minds On	<p>Mini Lesson on novums using handout.</p> <p>What makes SF different from other genres?</p> <p>What do novums look like?</p> <p>How can I tell what the novum is? [10 minutes]</p> <p>Discuss reading purpose: Highlight ‘new’ things that makes the story SF. [5 minutes]</p>	<p>Assessment Opportunities</p> <p>Assessment <i>as</i> learning: Encouraging students to consider why they think the things they think, and using evidence from the text to support interpretations</p>	
During: Action!	<p>Read “The People of Sand and Slag” page 1-9. [15 minutes]</p> <p>Discussion: Novums in “The People of Sand and Slag” and the novels → What ‘new thing’ did they notice that makes the texts different from their own words?</p> <p>What new things did you notice?</p> <p>What parts of the story did you not understand fully?</p> <p>Of all the new things you noticed, what do you think the new thing is, the novum, the thing that makes all the difference? What makes you choose this novum as the most important? [15 minutes]</p>		<p>Differentiated Instruction:</p> <p>Reading aloud, working through the text together</p> <p>Visual resources to support new learning</p>
After: Consolidation & Connection	<p>Reading/Work time:</p> <p>Independent Activity: Pick out quotes from the novel you selected that describes new things, and isolate potential novums (the thing in your novel that makes all the difference)</p> <p>[25 minutes]</p>		
Next Steps	<ul style="list-style-type: none"> • Reading due this class: page 166 • Reading due next class: page 178 		

ENG4U Lesson 2: Cognitive Estrangement		
	<p>Expectations</p> <p>OC 1.3 select and use the most appropriate listening comprehension strategies before, during, and after listening to understand oral texts, including complex and challenging texts; 1.5 develop and explain interpretations of oral texts, including complex and challenging texts, using evidence from the text and the oral and visual cues used in it insightfully to support their interpretations;</p> <p>RL 1.3 identify the most important ideas and supporting details in texts, including complex and challenging texts; 1.4 make and explain inferences of increasing subtlety and insight about texts, including complex and challenging texts, supporting their explanations with well-chosen stated and implied ideas from the texts; 1.6 analyse texts in terms of the Information, ideas, issues, or themes they explore, examining how various aspects of the texts contribute to the presentation or development of these elements; 3.2 use decoding strategies effectively to read and understand unfamiliar words, including words of increasing difficulty.</p>	<p>Materials</p> <ul style="list-style-type: none"> · Cognitive Estrangement handout · “The People of Sand and Slag” story · Highlighters, pens, etc. for interactions with the text · Discussion questions · Computer & Projector to connect to own website with ‘independent activity’ options · Reading Schedule for board
Before: Minds On	<p>What is critical thinking to you? Brainstorming [5 minutes]</p> <p>Mini lesson on Cognitive Estrangement & Critical Thinking using handout</p> <p>What is critical thinking?</p> <p>What is cognitive estrangement?</p> <p>How are they connected? [15 minutes]</p>	<p>Assessment Opportunities</p> <p>Assessment <i>for</i> learning: I have students brainstorm what they think critical thinking is before beginning the lesson to build on their understanding of the concept</p> <p>Assessment <i>as</i> learning: Students have the opportunity in this lesson to consider how they are critical thinkers, and how they might use critical thinking</p>
During: Action!	<p>Read “The People of Sand and Slag” page 9-17 and focus on cognitive estrangement. [20 minutes]</p> <p>Discussion about cognitive estrangement:</p> <p>How does cognitive estrangement connect to our description of critical thinking from the beginning of class?</p> <p>How might the idea of cognitive estrangement help you read SF stories differently? [15 minutes]</p>	<p>Differentiated Instruction:</p> <p>Reading aloud and encouraging interactions with the text; Visual resources</p>
After: Consolidation & Connection	<p>Reading/Work time:</p> <p>Independent activity: Quote work using cognitive estrangement to link “The People of Sand and Slag” and their own novel to contemporary contexts using critical thinking strategies of compare and contrast. [20 minutes]</p>	
Next Steps	<ul style="list-style-type: none"> • Reading due this class: page 178 • Reading due next class: page 195 	

ENG4U Lesson 3: Extrapolation and Science Fictionality			
	<p>Expectations</p> <p>OC 1.3 select and use the most appropriate listening comprehension strategies before, during, and after listening to understand oral texts, including complex and challenging texts; 1.5 develop and explain interpretations of oral texts, including complex and challenging texts, using evidence from the text and the oral and visual cues used in it insightfully to support their interpretations</p> <p>RL 1.3 identify the most important ideas and supporting details in texts, including complex and challenging texts; 1.4 make and explain inferences of increasing subtlety and insight about texts, including complex and challenging texts, supporting their explanations with well-chosen stated and implied ideas from the texts; 1.5 extend understanding of texts, including complex and challenging texts, by making rich and increasingly insightful connections between the ideas in them and personal knowledge, experience, and insights; other texts; and the world around them; 1.6 analyse texts in terms of the Information, ideas, issues, or themes they explore, examining how various aspects of the texts contribute to the presentation or development of these elements</p>	<p>Materials</p> <ul style="list-style-type: none"> · Cognitive Estrangement handout · “The People of Sand and Slag” story · Highlighters, pens, etc. for interactions with the text · Discussion questions · Computer & Projector to connect to own website with ‘independent activity’ options · Reading Schedule for board 	
Before: Minds On	Mini lesson on Extrapolation and Science Fictionality using the handout [25 minutes]		<p>Assessment Opportunities</p> <p>Assessment <i>as</i> learning: Students have the opportunity in this lesson to consider their own thinking and how they view the world from a critical perspective</p>
During: Action!	<p>Read “The People of Sand and Slag” (finish story) with a focus on extrapolation – How might this story take inspiration from the present? How do various aspects of the text relate to our own lives? [15 minutes]</p> <p>Discuss extrapolation and world building as critical thinking, with science fictionality as a critical lens. [15 minutes]</p>	<p>Differentiated Instruction:</p> <p>Reading aloud with students following along; Visual resources (handouts etc.)</p>	
After: Consolidation & Connection	<p>Read/Work time:</p> <p>Independent activity: Pick one quote or section of the novel you are reading and link it to potential contemporary inspiration/issues. [20 minutes]</p>		
Next Steps	<ul style="list-style-type: none"> • Reading due this class: page 195 • Reading due next class: page 224 		

ENG4U Lesson 4: Critical Theory Overview & Assignment Introduction			
<p>Expectations RL 1.5 extend understanding of texts, including complex and challenging texts, by making rich and increasingly insightful connections between the ideas in them and personal knowledge, experience, and insights; other texts; and the world around them; 1.6 analyse texts in terms of the information, ideas, issues, or themes they explore, examining how various aspects of the texts contribute to the presentation or development of these elements; 1.8 identify and analyse the perspectives and/or biases evident in texts, including complex and challenging texts, commenting with understanding and increasing insight on any questions they may raise about beliefs, values, identity, and power.</p>	<p>Materials</p> <ul style="list-style-type: none"> · Final assignment handout · Critical Theory handout · ‘Literary theories’ cards · Reading schedule for the board · Chart paper, markers 		
Before: Minds On	<p>“Reading the word and the world” – Open discussion [5 minutes] Mini lesson on critical theory: Work through handout [5 minutes] Class/Race/Gender/Sexual Orientation/Disability triangle [10 minutes] Work through main words: Getting over the word ‘theory,’ Ideology, Perspective, Power and Privilege, the canon. [10 minutes] Introduce final assignment [20 minutes]</p>		<p>Assessment Opportunities</p> <p>Assessment <i>for</i> learning: Students contribute to a communal</p>
During: Action!	<p>Discussion activity: Students will be divided into 5 groups, and will be given cards describing the critical theories they will learn about (feminist, Marxist, biographical, new historicism, postcolonialism) and will be given 10 minutes to brainstorm as many different ideas as they can about how the theory they are given might apply to the novel <i>Parable of the Sower</i>. [10 minutes]</p>	<p>Differentiated Instruction:</p> <p>Visual resources</p> <p>Group work to limit risk when working with new ideas.</p>	<p>understanding of key words and engage in discussions regarding unfamiliar topics together in a risk-free context.</p>
After: Consolidation & Connection	<p>Each group will be asked to present on what they came up with [10 minutes]</p>		<p>Assessment <i>as</i> learning: Students will begin to consider how various ways of thinking contribute to their understanding of texts and experiences in their own lives, and interrogate their own ideologies.</p>
Next Steps	<ul style="list-style-type: none"> • Reading due this class: page 224 • Reading due next class: 244 		

ENG4U Lesson 5: Feminist and Marxist Literary Criticism		
<p>Expectations RL 1.5 extend understanding of texts, including complex and challenging texts, by making rich and increasingly insightful connections between the ideas in them and personal knowledge, experience, and insights; other texts; and the world around them; 1.6 analyse texts in terms of the information, ideas, issues, or themes they explore, examining how various aspects of the texts contribute to the presentation or development of these elements; 1.8 identify and analyse the perspectives and/or biases evident in texts, including complex and challenging texts, commenting with understanding and increasing insight on any questions they may raise about beliefs, values, identity, and power</p>	<p>Materials · Computer & Projector · Feminist/Marxist Literary criticism handout · Activity information</p>	
Before: Minds On	<p>Mini lesson on Feminist Literary Criticism (Gender Theory) & Marxist Literary Criticism (Social Class Theory) and key terms (Neoliberalism?) [10 minutes]</p> <p>Introduce slam poetry and the goal of the activity [5 minutes]</p> <p>Blythe Baird – “Pocket-Sized Feminism” https://www.youtube.com/watch?v=vT74LH0W8ig [5 minutes] (Gender Theory)</p> <p>Siaara Freeman – “The Drug Dealer’s Daughter” https://www.youtube.com/watch?v=WsTUP-uUmns [5 minutes] (Social Class Theory)</p>	<p>Assessment Opportunities</p> <p>Assessment <i>as</i> learning: Students will be encouraged to pay attention to their own thinking, and apply new conceptual frameworks to the text.</p>
During: Action!	<p>Activity: Quote work, using feminist literary criticism and Marxist literary criticism to analyze the text – pick one quote for each of gender theory and social class theory and apply the significant questions for each quote. [20 minutes]</p> <p>Differentiated Instruction:</p> <p>Visual resources</p> <p>Multiple opportunities to practice theoretical frameworks.</p>	
After: Consolidation & Connection	<p>Reading/Work time. [30 minutes]</p>	
Next Steps	<ul style="list-style-type: none"> • Reading due this class: page 244 • Reading due next class: page 257 	

ENG4U Lesson 6: Postcolonialism, Biographical Criticism and (New) Historicism			
<p>Expectations RL 1.5 extend understanding of texts, including complex and challenging texts, by making rich and increasingly insightful connections between the ideas in them and personal knowledge, experience, and insights; other texts; and the world around them; 1.6 analyse texts in terms of the information, ideas, issues, or themes they explore, examining how various aspects of the texts contribute to the presentation or development of these elements; 1.8 identify and analyse the perspectives and/or biases evident in texts, including complex and challenging texts, commenting with understanding and increasing insight on any questions they may raise about beliefs, values, identity, and power</p>	<p>Materials</p> <ul style="list-style-type: none"> · Computer & Projector · Postcolonialism~handout · Activity information 		
Before: Minds On	<p>Mini lesson on postcolonialism, biographical & new historicism [10 minutes]</p> <p>Pages Matam, Elizabeth Acevedo & G. Yamazawa – “Unforgettable” https://www.youtube.com/watch?v=Xvah3E1fP20 (postcolonialism) [5 minutes]</p> <p>G. Yamazawa – “Elementary” https://www.youtube.com/watch?v=P-cYjUCudbA (bio. criticism) [5 minutes]</p> <p>Javon Johnson – “cuz he’s black” https://www.youtube.com/watch?v=u9Wf8y_5Yn4 (new historicism) [5 minutes]</p>	<p>Assessment Opportunities</p> <p>Assessment <i>as</i> learning: Students will be encouraged to pay attention to their own thinking, and apply new conceptual frameworks to the text.</p>	
During: Action!	<p>Activity: Quote work, using postcolonialism, biographical perspectives and new historicism to analyze the text – pick one quote for each of postcolonialism, biographical perspectives and new historicism and apply the significant questions for each quote. [20 minutes]</p>		<p>Differentiated Instruction:</p> <p>Visual resources</p> <p>Multiple opportunities to practice theoretical frameworks.</p>
After: Consolidation & Connection	<p>Reading/Work time. [30 minutes]</p>		
Next Steps	<ul style="list-style-type: none"> • Reading due this class: page 257 • Reading due next class: page 278 		

ENG4U Lesson 7: Watermark		
<p>Expectations</p> <p>OC 1.2 select and use the most appropriate active listening strategies when participating in a wide range of situations; 1.3 select and use the most appropriate listening comprehension strategies before, during, and after listening to understand oral texts, including complex and challenging texts; 1.5 develop and explain interpretations of oral texts, including complex and challenging texts, using evidence from the text and the oral and visual cues used in it insightfully to support their interpretations;</p> <p>RL 1.5 extend understanding of texts, including complex and challenging texts, by making rich and increasingly insightful connections between the ideas in them and personal knowledge, experience, and insights; other texts; and the world around them; 1.6 analyse texts in terms of the information, ideas, issues, or themes they explore, examining how various aspects of the texts contribute to the presentation or development of these elements 1.8 identify and analyse the perspectives and/or biases evident in texts, including complex and challenging texts, commenting with understanding and increasing insight on any questions they may raise about beliefs, values, identity, and power</p> <p>MS 1.2 interpret media texts, including complex or challenging texts, identifying and explaining with increasing insight the overt and implied messages they convey; 2.1 identify general and specific characteristics of a variety of media forms and demonstrate insight into the way they shape content and create meaning</p>		<p>Materials</p> <ul style="list-style-type: none"> · Discussion questions · Computer & Projector to connect to own website with ‘independent activity’ options and view documentary · <i>Watermark</i> login · Reading Schedule for board
Before	<p>Learning goals for documentary: connections to written assignment [5 minutes]</p> <p>Discuss the documentary, format, and the concept of water (what it represents, why it is important, etc.) [5 minutes]</p>	
During: Action!	<p>Watching <i>Watermark</i> (stopping-points listed below)</p> <p>2:55 Colorado River Delta</p> <p>6:45 Dam Silt Release</p> <p>10:20 Edward Burtynsky’s inspiration</p> <p>12:21 Ogallala Aquifer</p> <p>16:10 Imperial Valley, CA</p> <p>17:30 Tannery, Bangladesh</p> <p>22:50 BC</p> <p>27:35 Abalone Farms, China</p> <p>34:10 National Ice Core Laboratory, Denver</p> <p>36:36 Greenland Ice Sheet</p> <p>39:07 Bellagio Fountains, Las Vegas [40 minutes]</p>	<p>Differentiated Instruction:</p> <p>Providing note taking suggestions and covering big ‘themes’ before viewing</p>
After: Consolidation & Connection	<p>Discussion on <i>Watermark</i>: What parallels do you notice between the novel and the documentary?; How do you see humanity’s relationship to water changing in the future?; Do you think water scarcity will impact society as it does in the novel?; Why do you think this documentary was shot in this way, with small bits of stories throughout?; What is the experience of time in these stories? (explain) How does this connect to the idea of science fictionality (seeing the present and the future simultaneously)? [10 minutes] Reading/Work time [15 minutes]</p>	
Next Steps	<ul style="list-style-type: none"> • Reading due this class: page 278 • Reading due next class: page 293 	

ENG4U Lesson 8: <i>Watermark</i>			
	<p>Expectations [Continued curriculum expectations from Lesson 7]</p>	<p>Materials</p> <ul style="list-style-type: none"> · Discussion questions · Computer & Projector to connect to own website with ‘independent activity’ options and view documentary · <i>Watermark</i> login · Reading Schedule for board 	
Before	<p>Discuss significant scenes or images from the first half of the documentary. [5 minutes]</p>	<p>Assessment Opportunities</p> <p>Assessment <i>for</i> learning: Before viewing the second half of the documentary, giving students a chance to discuss the parts of the film that has stood out to them so far.</p>	
During: Action!	<p>Watching <i>Watermark</i> (stopping-points listed below)</p> <p>42:25 Xiluodu Dam 49:00 Step Wells, Rajasthan 51:15 Lone Pine, CA 55:40 Rice Paddies 1:00:50 Prayagraj 1:09:25 US Open of Surfing/Discovery Bay, California 1:13:00 Steidl Publishing (Burtynsky’s book) 1:14:30 The Dam 1:17:25 Neem/Blue Lagoon Geothermal Springs, Iceland 1:22:20 Northern BC [45 minutes]</p>		<p>Differentiated Instruction:</p> <p>Providing note taking suggestions and covering big ‘themes’ before viewing</p>
After: Consolidation & Connection	<p>Discussion on <i>Watermark</i>:</p> <p>What parallels can you draw between the future Butler envisions in her novel and the latter half of this documentary? (mention Lone Pine)</p> <p>Seeing the second half of the documentary, revisit the following:</p> <p>How do you see humanity’s relationship to water changing in the future? Do you think water scarcity will impact society?</p> <p>Why do you think this documentary was shot in this way, with small bits of stories throughout? [10 minutes]</p> <p>Reading/Work time [15 minutes]</p>		
Next Steps	<ul style="list-style-type: none"> • Reading due this class: page 293 • Reading due next class: 314 <p>Next class homework: Any questions students have about anything pertaining to the course for a review/discussion class</p>		

ENG4U Lesson 9: Content Review & Discussion	
<p>Expectations</p> <p>OC 1.2 select and use the most appropriate active listening strategies when participating in a wide range of situations; 1.3 select and use the most appropriate listening comprehension strategies before, during, and after listening to understand oral texts, including complex and challenging texts; 1.5 develop and explain interpretations of oral texts, including complex and challenging texts, using evidence from the text and the oral and visual cues used in it insightfully to support their interpretations</p> <p>RL 1.5 extend understanding of texts, including complex and challenging texts, by making rich and increasingly insightful connections between the ideas in them and personal knowledge, experience, and insights; other texts; and the world around them; 1.6 analyse texts in terms of the information, ideas, issues, or themes they explore, examining how various aspects of the texts contribute to the presentation or development of these elements</p>	
<p>Materials</p> <ul style="list-style-type: none"> · Discussion questions · All handouts · Reading Schedule for board 	
Before: Minds On	Content review lesson (SF, critical theory, the novel) [20 minutes]
During: Action!	<p>Q&A [25 minutes]</p> <p>Differentiated Instruction:</p>
After: Consolidation & Connection	Work time [30 minutes]
Next Steps	<ul style="list-style-type: none"> • Reading due this class: page 314 • Reading due next class: 329 (end)
<p>Assessment Opportunities</p> <p>Assessment <i>for</i> learning: Providing an opportunity for students to discuss what they already know.</p> <p>Assessment <i>as</i> learning: Students will come with questions about the unit, which will involve reflection regarding understanding of the text and their own learning process/ progress.</p>	

ENG4U Lesson 10: Final Assignments – Work Period			
<p>Expectations W 1.2 generate, expand, explore, and focus ideas for potential writing tasks, using a variety of strategies and print, electronic, and other resources, as appropriate; 1.3 locate and select information to fully and effectively support ideas for writing, using a variety of strategies and print, electronic, and other resources, as appropriate; 1.4 identify, sort, and order main ideas and supporting details for writing tasks, using a variety of strategies and selecting the organizational pattern best suited to the content and the purpose for writing; 1.5 determine whether the ideas and information gathered are accurate and complete, interesting, and effectively meet the requirements of the writing task; 3.2 build vocabulary for writing by confirming word meaning(s) and reviewing and refining word choice, using a variety of resources and strategies, as appropriate for the purpose; 3.7 produce pieces of published work to meet criteria identified by the teacher, based on the curriculum expectations</p>	<p>Materials</p> <ul style="list-style-type: none"> · Computer & Projector for looking information up with students · Relevant ‘of interest’ texts to support student inquiry 		
Before	Introduce resources brought in. [5 minutes]	<p>Assessment Opportunities</p>	
During: Action!	<p>Students prepare for writing assignment next day, generating teacher-approved notes and articles which students will be allowed to bring in to the writing period next day.</p>		<p>Differentiated Instruction:</p> <p>Allowing for last-minute questions from students regarding ideas they want to explore in their written pieces</p> <p>Clarifying concepts</p>
After: Consolidation & Connection			
Next Steps	Writing assignment in-class next class.		

ENG4U Lesson 11: Work Period		
<p>Expectations W 1.2 generate, expand, explore, and focus ideas for potential writing tasks, using a variety of strategies and print, electronic, and other resources, as appropriate; 1.3 locate and select information to fully and effectively support ideas for writing, using a variety of strategies and print, electronic, and other resources, as appropriate; 1.4 identify, sort, and order main ideas and supporting details for writing tasks, using a variety of strategies and selecting the organizational pattern best suited to the content and the purpose for writing; 1.5 determine whether the ideas and information gathered are accurate and complete, interesting, and effectively meet the requirements of the writing task; 3.2 build vocabulary for writing by confirming word meaning(s) and reviewing and refining word choice, using a variety of resources and strategies, as appropriate for the purpose; 3.7 produce pieces of published work to meet criteria identified by the teacher, based on the curriculum expectations</p>	<p>Materials</p> <ul style="list-style-type: none"> · Copies of the assignment sheet · Extra pencils, pens, paper, a stapler to staple work to the assignment sheet 	
Before: Minds On	<p>Students write their final assignment in class using notes from research and quotes.</p>	<p>Assessment Opportunities</p> <p>Assessment of learning: Final written assignment.</p>
During: Action!		<p>Differentiated Instruction:</p> <p>Allowing students to handwrite or type based on individual needs and preferences</p> <p>Allowing notes/printed resources from previous work days</p>
After: Consolidation & Connection	<p>Before students leave, sign finished rough copies so students can take them home to type and edit – students will hand in the rough copy with the good copy.</p>	
Next Steps		

ENG4U Lesson 12: Finishing Assignments and Discussion		
<p>Expectations</p> <p>OC 1.6 extend understanding of oral texts, including complex and challenging texts, by making insightful connections between the ideas in them and personal knowledge, experience, and insights; other texts; and the world around them; 1.5 extend understanding of texts, including complex and challenging texts, by making rich and increasingly insightful connections between the ideas in them and personal knowledge, experience, and insights; other texts; and the world around them; 1.6 analyse texts in terms of the information, ideas, issues, or themes they explore, examining how various aspects of the texts contribute to the presentation or development of these elements; 1.8 identify and analyse the perspectives and/or biases evident in texts, including complex and challenging texts, commenting with understanding and increasing insight on any questions they may raise about beliefs, values, identity, and power.</p>	<p>Materials</p> <ul style="list-style-type: none"> · Discussion questions 	
<p style="writing-mode: vertical-rl; transform: rotate(180deg);">Before: Minds On</p>	<p>In this class, students are given the opportunity to discuss their written pieces and reflect on the entirety of the unit together.</p>	<p>Assessment Opportunities</p>
<p style="writing-mode: vertical-rl; transform: rotate(180deg);">During: Action!</p>		<p>Differentiated Instruction:</p>
<p style="writing-mode: vertical-rl; transform: rotate(180deg);">After: Consolidation & Connection</p>		
<p style="writing-mode: vertical-rl; transform: rotate(180deg);">Next Steps</p>		

APPENDIX B: Study Questionnaire

Critical Potential of Science Fiction in Education: Initial Questionnaire

The primary purpose of this survey is to assist me in understanding how your thoughts on critical thinking and science fiction might have changed from the beginning of the study through to the post-study interviews. You retain the right to not answer any questions on this survey. This survey will not impact your grades. Please answer the following questions to the best of your ability.

What do you think science fiction is? Provide examples if necessary.

What do you think critical thinking is? Provide examples if necessary.

Have you read any science fiction texts, or watched any science fiction movies in school? (*circle your answer*)

No Yes *If yes, which texts/movies?*

Have you read any science fiction texts, or watched any science fiction movies outside of school? (*circle your answer*)

No Yes *If yes, which texts/movies?*

Rate your knowledge of science fiction:

1 2 3 4 5 6 7 8 9 10

(no knowledge)

(some knowledge)

(very knowledgeable)

Additional comments in the areas of science fiction or critical thinking that you think might be useful for me to know (*use back if necessary*):

APPENDIX C: ENG4U Final Assessment

Critical Potential of Science Fiction in Education ENG 4U Final Assignment



By the end of this unit we will have:

- Explored the following Science Fiction literary devices as critical thinking tools: Novums, Cognitive Estrangement, Extrapolation and Science Fictionality
- Read part of the short story “The People of Sand and Slag” by Paulo Bacigalupi to see these literary devices ‘in action’
- Learned various forms of Critical Theory that can be used as ways to enter texts: Postcolonialism, New Historicism, Biographical/Contextual frameworks, Feminist Literary Criticism and Marxist Literary Criticism
- Read *Parable of the Sower* by Octavia Butler
- Watched “Watermark” by Jennifer Baichwal & Edward Burtynsky

This final writing assignment is your opportunity to use what you have learned to explore an area of interest related to the novel you read and contemporary issues.

Due: To be written in class October 26th

With October 25th as a work period to prepare research

Length: 2 pages

Weighting: 10% (I will collect this for data and then it will be graded by your teacher)

Description: You will write a 2-page opinion piece linking an issue from the novel you read (examples: environmental issues, climate change, class and economic issues, race and violence, terrorism and surveillance, technology, media and power) to a contemporary issue or event. You will then use SF literary devices and critical theory approaches discussed to consider how the SF novel you read might help readers critically interrogate the world in

which we live. The issue from the SF future in *Parable of the Sower* and the contemporary issue or event you choose to explore in entirety up to you – the important thing is that you use SF and critical theory to consider new critical perspectives in an area of interest!

Rubric

	Level 4	Level 3	Level 2	Level 1	Grade
Clarity of Argument	Students makes a clear connection between SF futures and their own present, and they present their opinion with great clarity.	Student makes a moderately clear connection between SF futures and their own present, and they present their opinion with moderate clarity.	Student makes a somewhat clear connection between SF futures and their own present, but their own opinion is minimally clear.	Student makes a minimal connection between SF futures and their own present, but do not present a clear personal opinion.	
Understanding of Content	Substantial, specific evidence (i.e. facts, examples, opinions, details, quotes from the text) supports argument.	Moderate amounts of specific evidence to support argument.	Some specific evidence to support argument with some opinions unsupported.	Very little/no specific evidence to support argument.	
Use of SF as critical/ analytical tool	Student shows exceptional understanding of SF literary devices as critical and/or analytical tools, and uses SF to support their argument.	Student shows moderate understanding of SF literary devices as critical and/or analytical tools, and uses SF to support some of their argument.	Student shows some understanding of SF literary devices as critical and/or analytical tools, and minimally uses SF to support some of their argument.	Student shows very little understanding of SF literary devices as critical and/or analytical tools, and does not use SF to support their argument.	
Use of Critical Theory as analytical tool	Student shows exceptional understanding of critical theory as a critical and/or analytical tool, and uses critical	Student shows moderate understanding of critical theory as a critical and/or analytical tool, and uses critical theory	Student shows some understanding of critical theory as a critical and/or analytical tool, and minimally uses critical theory to frame	Student shows very little understanding of critical theory as a critical and/or analytical tool, and does not use critical	

	theory to frame their argument.	to frame some of their argument.	some of their argument.	theory to frame their argument.	
Conventions	Opinion piece has no errors in punctuation, grammar and spelling, and style is smooth and connected	Opinion piece has one or two errors which does not impact reader understanding, and style is relatively smooth and connected.	Opinion piece has three to five errors which somewhat impacts reader understanding, and paragraphs are not clearly connected.	Opinion piece has six or more errors which impacts reader understanding and paragraphs are not clearly connected	
				Total	/20

Images on first page retrieved from (left to right):

<http://stefanicox.com/wp-content/uploads/2015/06/Parable-of-the-Sower.jpg>

http://i.vimeocdn.com/video/446847841_1280x720.jpg

APPENDIX D: Interview Questions

Critical Potential of Science Fiction in Education: Interview Questions

The objective of this interview is to understand the development of participants' thoughts regarding science fiction and critical thinking, including impressions of science fiction as a genre. These interviews will be more fluid in nature than the survey, but will be compared to the survey to mark progress within the study. These interviews will take about 5-10 minutes for each student and will be conducted on a voluntary basis during class time.

1. Following the study *Critical Potential of Science Fiction in Education*, what do you think science fiction is? Provide examples if necessary.⁸
2. Following the study *Critical Potential of Science Fiction in Education*, what do you think critical thinking is? Provide examples if necessary.
3. If you have been in classes where science fiction texts were used, how were they used? How was this experience different?
4. Do you think science fiction should be used in school? Why or why not?
5. How are science fiction novels different from other types of novels you have read? How are they the same?
6. Do you think learning about science fiction has helped you think critically?
7. Do you think the futures portrayed in science fiction texts help readers/viewers understand the present better? Why or why not?
8. If your teacher wanted to do another unit on science fiction, what kind of suggestions would you make for them?
9. Do you have any questions or final comments about the study?

The interview will also be an opportunity for students to provide feedback on the study and their experiences participating, any opinions they have regarding the academic content of the unit, and their feelings regarding the science fiction texts they explored throughout the study. Students will be thanked for their participation at this time, and will be debriefed regarding who they might contact should they have any additional questions or concerns, and will also be made aware that their teacher will let them know the results of the study when data has been processed.

⁸ After the first few interviews, I only asked questions 1, 2, 4, 8, and 9 as most answers overlapped into other questions.

APPENDIX E: Assessment Exemplar

ENG4U Exemplar: Critical Potential of Science Fiction in Education

Paulo Bacigalupi in “The People of Sand and Slag” considers how humanity might function in centuries to come by exploring the potential of technological innovations in the areas of biology and longevity to extend the human lifespan. In this analysis I will first identify the novum in the text, and will then consider how Bacigalupi uses the method of extrapolation to create the world in which his characters live. As the story is deeply rooted in scientific innovation around the time when Bacigalupi wrote “The People of Sand and Slag,” I will then use the critical theory approaches of historicism and new historicism to explore how this story was inspired by scientific innovation of ten years ago, and how contemporary science helps me learn from the short story. Interacting with the text in this way allows me to consider the future of science, acknowledge the consequences of such innovation, and ultimately consider our potential as a species to defy death.

“The People of Sand and Slag” follows a group of enhanced humans who work for a mining corporation that extracts minerals from a devastated landscape in central North America, and the characters’ experiences when they discover a dog in the acid pits. Emphasis is placed on the characters’ emotional distance from the dog due to their genetic modification known as weeviltech, the novum of the story. Weeviltech enables the characters to regenerate limbs, allowing their bodies to endure seemingly unlimited physical strain and eat sand, mud and rock as sustenance. The dog is meant to highlight these changes in the human form, with one character noting to another: “It’s vulnerable to everything. It can’t swim in the ocean. It can’t eat anything. We have to fly its food to it. We have to scrub its water. Dead end of an evolutionary chain. Without science, we’d be as vulnerable as it.” (Bacigalupi) The novum is relative immortality, but also the

consequences of such innovations as the characters struggle to relate to something familiar to the reader, something that is vulnerable and authentically alive.

This story was written in 2004 and the technology that supports the characters' modification is rooted in science that existed in Bacigalupi's contemporaneous moment. By 2004 the Human Genome Project, an international effort to map the human genome and fully understand human DNA, had already been completed. Bacigalupi wrote this story in a cultural context where scientists were beginning to explore the potential this project had for facilitating the exploration of innovative possibilities in areas of longevity and genetic modification, although many debated the moral and ethical nature of such power. Acknowledging the differences in scientific innovation over a decade after it was written, it is clear science in this area has progressed and much of what Bacigalupi envisioned is increasingly less science fiction and more reality. Through the advent of 3D printing and the field of regenerative medicine alone it is possible to heal deceased organs, such as Anthony Atala discusses in his Ted Talk "Printing a human kidney," suggesting the future Bacigalupi envisions is now closer than ever.

Through acknowledging the novum and the extrapolative method Paolo Bacigalupi uses in "The People of Sand and Slag" as being inspired by science contemporaneous to the author, and through the use of historicism and new historicism to understand how knowledge of science impacts my reading of the story, it becomes obvious how important it is to address the consequences of such innovation. While in "The People of Sand and Slag" Bacigalupi does not openly condemn seeking out immortality, the character Chen's reflection at the end of the story ultimately urges the reader to be careful, and to acknowledge the possible consequences of leaving our humanity behind. He states, "Still, I remember when the dog licked my face and hauled its shaggy bulk onto my bed, and I remember its warm breathing beside me, and sometimes, I miss

it” (Bacigalupi). Through Chen, Bacigalupi urges readers to make sure we are responsible as we move into the future, and to acknowledge our own humanity as we push towards immortality.

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APPENDIX F: Introductory Handout⁹

What is Science Fiction?

Science fiction (sf) can be a ton of different things—it has many definitions! SF isn't *just* about aliens and other planets, although sometimes it can be. A science fictional world can look an awful lot like our own and, sometimes, our world can feel a lot like science fiction. Instead of giving you a definition, to the right are common characteristics of SF. Below are descriptions of two **rough** 'types' of SF. This information will help you as you begin exploring the genre.

Time: SF often takes place in the future. It can take place a few years from now, or in the 26th century, but an SF novel is almost always asking, "If (this) continues into the future, what will that look like?"

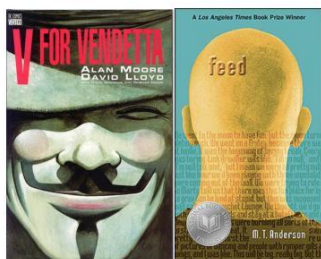
A Novum: The big new thing that makes the SF world different from our own. Many things in an SF novel could be different, but usually there is one big thing (a new societal structure, a big dumb object, a new invention or discovery) that makes all the difference.

Extrapolation: SF authors draw inspiration from their present in some way, encouraging the reader to compare the present to the future and see consequence.

"Hard" SF

Hard SF focuses on the science—making sure when characters time travel, go to outer space, split genes or colonize a new planet, that it matches what we know about science and follows a logical pattern. When an SF writer imagines a future with technology and science far more advanced than what we know, they could still be writing hard SF if fictional innovation connects to what we actually know.

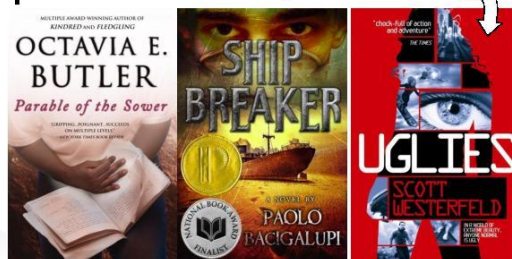
Examples: *The Martian* (2015), *Her* (2013)



"Soft" SF

Soft SF can also be scientifically accurate, but focus is placed on the impact the novum (**the** big new thing) has on society and/or individual characters. Instead of chemistry, physics and biology, soft SF draws from the soft sciences (sociology, psychology, political science, etc.). However, these definitions are not universally accepted—they are just helpful ways of thinking about SF. There are **many** kinds of SF!

Some of my favourites



⁹ All handouts in this appendix are in image format for reference. Downloadable PDF versions are available at <http://brittanytomin.ca/science-fiction-and-teaching/downloadable-handouts-on-sf-education/>

APPENDIX G: Novums Handout

Science Fiction Literary Device: Novums

“What makes science fiction different from other genres?”



· Many things make a science fiction story different from other types of stories, but the biggest difference is that a science fiction story usually focusses on one big difference between the present of the author and the future

· This is called a novum—a thing that makes us realize the fictional world is different from ours because whatever the novum is doesn't exist in the world as we know it, but **could** exist in the future

· Novums can be basically anything: a new planet, a scientific discovery, a robot, a different government structure

“What do novums look like?”



· In early science fiction, novums were often what are called BDOs— Big Dumb Objects. The main characters would find a big object on a planet and they would have no idea what it was, and the whole story involved them trying to figure it out

· Usually novums are connected to science or discovery in some way and have to make logical sense— for example, magic wouldn't usually be considered a science fiction novum unless it could somehow be explained by science.

“There are a lot of new things in science fiction stories. How do I know which one the novum is?”



· Science fiction novels are filled with all kinds of new things, but just because there are hoverboards in a story doesn't mean it is **the** novum

· Farah Mendelsohn in *The Intergalactic Playground* said of novums, “The novum is the idea or object that creates the rupture within the world as we understand it” (Mendelsohn, 2009, p. 10).

· In other words, the novum is the thing that keeps popping up, and seems to make the biggest difference when you compare your world to the SF one you are reading about.



Above Images retrieved from (left to right):

https://a.fastcompany.net/multisite_files/fastcompany/imagecache/1280/poster/2013/10/3019370-poster-1280-dna.jpg

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APPENDIX H: Cognitive Estrangement Handout

Cognitive Estrangement & Critical Thinking

“What is cognitive estrangement?”

Darko Suvin in “Estrangement and Cognition” stated: “Sf is, then, a literary genre whose necessary and sufficient conditions are the presence and interaction of estrangement and cognition, and whose main formal device is an imaginative framework alternative to the author’s empirical environment” (Suvin, 1979, p. 27).

Which basically means...

Science fiction texts work because of the novum, that new thing that makes the fictional future different from the present. The fact that the power of a science fiction story comes from differences between the future presented and the life of the reader means that when you read science fiction, you are automatically comparing your world and the fictional world—you are thinking about what makes it different, deciding if it is better or worse, and coming to conclusions because of cognitive estrangement. This is what makes science fiction stories important. We can use them as opportunities to experiment, or think about consequences. As Farah Mendelsohn in *The Intergalactic Playground* says:

[...] in the “full sf story,” the resolution is not the end of the story, it is the beginning, for sf resolutions are about change and consequence. [...] Identification of novum and cognitive dissonance usually leads to the idea of causality and consequence; that “what if?” needs to be followed by the concept of “if, then” (Mendelsohn, 2009, p. 12 - 13)

So what does this have to do with **critical thinking**?

...and what is **critical thinking** anyway?

- A way of thinking that sees the future as open, full of possibilities;
- A process of continually questioning assumptions and asking “Why?”;
- Being aware of alternatives, and exploring different ways of thinking and being;
- Challenging the status quo, the assumed ‘way it has to be’;
- A questioning of power and systems of oppression in the hope of making the world a better place.

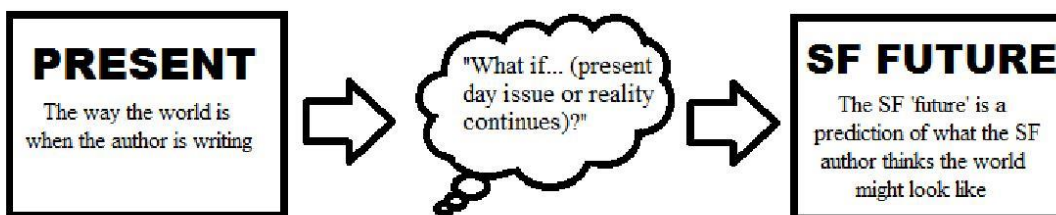
Science fictional futures give us an opportunity to question our own world by comparing our present to the story, see alternative ways of thinking and being through discovery and exploration, identify consequences of various actions, and ultimately question the systems of power we inhabit.

APPENDIX I: Extrapolation and Science Fictionality Handout

Extrapolation & Science Fictionality

Debra Benita Shaw in *Technoculture: The Key Concepts* states: [The term extrapolation] refers to estimates about the future based on known facts and observations but it has been adopted by SF academics to describe the thought process which SF writers employ in constructing future and alternative worlds. Science fiction is never really about the future but it makes use of the future to extrapolate from the cultural conditions of the author's time and place. It is a projection of what might be, given the current state of society and, perhaps more importantly, it takes for granted that social conditions are structured by, and a fundamental structuring element in, the development of new technologies. (Shaw, 2008, p. 1-2)

Basically, we can think of science fiction stories as **thought experiments**:



Being aware of how SF authors are inspired by their present helps us realize how useful science fiction texts can be in questioning the way things are in the present. For example, if a story shows us what the world will look like if we ignore climate change and that future is something we don't want to become a reality, we can use what we learn from those stories to drive action and make positive change in the present—we can avoid that future. Of course, SF stories aren't purely predictive. They are meant to be fun and interesting. But they also provide important commentary on issues currently impacting our world.

The concept of **science fictionality**, coined by SF scholar Istvan Csicsery-Ronay Jr., pushes this idea one step further. This line of thinking suggests we shouldn't just be inspired by science fiction, but should think science fictionally—we should critically think about everything in terms of potential consequences, what kind of future it will lead to, and acknowledge how quickly the world is changing.

"The future is already here—it's just not evenly distributed."

- William Gibson, SF writer and person who coined the term 'internet'

APPENDIX J: World Building Handout

WORLD BUILDING

How do science fiction story tellers (writers, directors, designers) build their science fictional worlds?

PLOT/NOVUM

- An author might start off with their novum—their ‘new thing’ that will make all the difference
- They might already have a story they want to tell, an idea of their audience and the ‘What if?’ they want to explore

SETTING

- How far in the future will this story take place? Will it even take place on Earth?
- What are the people like in the story? What kind of needs would they have regarding where they live? What problems do they face? What is the environment like?

Culture/ Community

- What is the government like? What do families look like? What new traditions are there?
- What history do these people have? If a story takes place in 2500, what happened between now and then?

STYLE/ Flavour

- What does this future feel like? How close is it to the present of the author?
- What extra little details will they add to make it feel like the future? How do people get around? What discoveries have been made?

Extrapolation: Inspired by the present

How have they been inspired by the present and issues they face in their own world? What issues (environmental, social, scientific, political, etc.) do they want their story to comment on? How obvious will these connections be— will they mention the authors’ present outright, or only suggest connections?

The Absent Paradigm: SF authors don’t tell us everything about their world—we have to use our imaginations to guess what things must be like. They might hint at different pieces of information about the world, while other things are completely up to us to think about.



Activity on World Building: *The Hunger Games*

This is a picture of the Capitol of Panem.

What do we know about the world *The Hunger Games* takes place in? What is left to our imagination?

Image retrieved from;

http://vignette2.wikia.nocookie.net/thehungergames/images/a/a5/Capitol_entrance.png/revision/latest?cb=20130720231202

APPENDIX K: Critical Theory Handout

Critical Theory

While critical (literary) theory has to do with how you interact with texts, the main goal is for you to learn different ways of seeing and thinking. Regardless of your career goals, being able to think in a variety of different ways will open up opportunities to solve problems and understand the world around you more deeply.

Critical theory requires critical thinking—**active**, reflective thinking. Many critical theory approaches will demand you reflect on your own perspectives and why you interpret things the way you do.

What is
Critical
Theory?

Critical theory helps you to understand different perspectives, as various critical 'lenses' might require you to think about how a specific character would feel, or to consider a characters' experiences in broader contexts.

We use the word critical theory to describe a variety of different ways of seeing—think of them like sunglasses you can put on and take off. Critical theory (or literary theory) brings out what is already hidden in a text—the way you approach a text (the way you think about it, what you pay attention to) makes all the difference!

Critical theory offers us powerful tools in the form of approaches and questions which help us:

- Understand ourselves, our own beliefs and experiences, and others' perspectives;
- Understand the world around us, and more effectively change our own lives for the better;
- Communicate in different ways, leading to more control over the texts we read and the lives we live;
- Become more effective and dynamic thinkers, giving us **power** to challenge the status quo.

We will be looking at the following critical theories and applying them to science fiction: **gender/feminist criticism, social class/Marxist criticism, postcolonialism, new historicism** and the **biographical perspective**. There are more distinct critical theories (and an infinite number of ways of seeing'), and as you learn the tools offered by each theory you can pick and choose how to see a text, a video, a song, or situation in your life.

Choosing Critical Lenses

Remember that the way we read is a choice; the interpretation of a text depends on active, conscious decisions on the part of the reader.

1. The lenses are not always mutually exclusive, but you should be aware which are incompatible by understanding the assumptions behind them.
2. No single lens gives the clearest view; all have limitations.
3. Turning these lenses on your experiences—your life—can help you understand and think clearly about your own ideologies

APPENDIX L: Literary Theory Cards¹⁰**Reader-Response Lens**

Essential Question: How does this text reflect the experience, beliefs, and understandings of its reader?

Central Concerns: effect, personal reflection, description, subjectivity

Critical Assumptions:

1. The text does not exist without a reader.
2. An author's intentions are unavailable to a reader outside the text.
3. Reading is the active process of evaluating a personal response to a text.
4. A reader's changing perceptions that result from reading are valuable.

What to do:

1. Move through the text carefully and slowly, describing the response of an informed reader at various points; note changes in response.
2. Describe your own responses to the text, using evidence and explanation.
3. React to the text as a whole, expressing the subjective and personal response it engenders.

Archetypal Lens

Essential Question: How does this text show similarities to ancient story designs, character categories, and imagery?

Central Concerns: myth, image, dreams, rituals, pattern, model

Critical Assumptions:

1. Imaginative work is indebted to ancient systems of meaning, including ritual, mythology, and inherited symbolism (the "collective unconscious").
2. There are no new stories.
3. Conflicts, characters, and symbols in fiction and poetry come from the same place as dreams, and can be interpreted the same way dreams are.

What to do:

1. Determine how the text mirrors certain inherited story structures, such as the heroic journey, creation myths, fairy tales, legends, and so forth.
2. Determine how the characters in the text can be said to reflect inherited character types such as the hero, the crone, the wicked stepmother, and so forth.
3. Show patterns in the text that resemble dream logic or seem to be without explicit context.

¹⁰ Resource borrowed from: Appleman, D. (2009). *Critical Encounters in High School English: Teaching Literary Theory to Adolescents*. 2nd Ed. New York: Columbia University Press.
Full free online resources from this text available at: tpress.com

Biographical Lens

Essential Question: How does this text reflect the experiences, beliefs, and intentions of its maker(s)?

Central Concerns: context, systems of meaning, commentary, society, belief, self-expression

Critical Assumptions:

1. Meaning is contextual.
2. Writing is a product of social, political, and historical forces.
3. Writing reflects the systems of meaning available to the author.
4. Interpretation of writing demands interpretation of its historical or biographical context.

What to do:

1. Research the author's life, and relate that information to the text.
2. Research the author's time—its historical, geographical, political, and intellectual moment—and relate that data to the text.
3. Research the systems of meaning available to the author, and relate those systems to the text.

New Criticism/Formalism Lens

Essential Question: What does analysis of the text's form reveal about the meaning of its content?

Central Concerns: form, unity, ambiguity, resolution, pattern, literacy language

Critical Assumptions:

1. A text will teach you how to read it; the work itself is the only locus of critical interest.
2. The author's intentions are unavailable and irrelevant.
3. A text is valuable if it contains ambiguities, ironies, and complexities that can be resolved through careful analysis of its form.
4. A complex work will reveal a unifying theme.

What to do:

1. Determine oppositions, ambiguities, ironies, and complexities in the text.
2. Read closely; assume there are no "mistakes" in a text, or that any aspect of text is "unintentional." Study the interrelationship of literary elements.
3. Explicate the text by showing how it resolves its ambiguities.

Gender/Feminist Lens

Essential Question: How does this text reinforce, critique, or challenge definitions of masculinity or femininity?

Central Concerns: gender roles, objectivity/objectification, representation, differences

Critical Assumptions:

1. Any text cannot exist outside of a gender frame of reference.
2. Historically, writing (and interpretation) has been dominated by men and masculine perceptions; it is important for women to create a feminine/feminist way of writing and reading.
3. Men and women are essentially different, and differences can be examined in social behavior, ideas, and values; these differences should be recognized.
4. Stereotyping is dangerous and can lead to destructive social norms.

What to do:

1. Consider the gender of the author, the reader, and the characters/voices in the text: how does the text reflect social gender codes?
2. Ask how the text reinforces or undermines gender stereotypes.
3. Imagine yourself as someone of the opposite gender reading this work.

Social Power/Marxist Lens

Essential Question: How does this text comment on or represent class conflict?

Central Concerns: power, economics, class, differences, fairness, society

Critical Assumptions:

1. The way people think and behave is determined by basic economic factors.
2. Class conflict is the same as political conflict.
3. The wealthy class exploits the working class by forcing their own values and beliefs upon them, usually through control of working conditions and money.
4. These ideas can be applied to the study of literature, which is a product of culture and social conflict.

What to do:

1. Explore the way different economic classes are represented in the text.
2. Determine the ideological stance of the text. (Is it radical? Conservative?)
3. Link the text to the social class of its author.
4. Consider how the text itself is a commodity that reproduces certain beliefs and behaviors. What is the effect of the work as means of control?

Psychological Lens

Essential Question: How can we apply psychology and psychoanalytical criticism to gain insights into the behavior and motivations of authors and characters?

Central Concerns: expression, personality, state of mind, designs of author

Critical Assumptions:

1. An author reveals repressed wishes or fears in a literary text.
2. Creative writing, like dreaming, can unlock the subconscious.
3. There are some patterns such as anxiety, repression, fear of death that can be applied both to individual characters and authors as well as generally to human beings.

What to do:

1. Look for an underlying psychological subtext in the work.
2. Discover key biographical moments and relate them to the text.
3. Try to explain the behavior of the characters in psychological terms, such as projection, repression, fear (of abandonment, sexuality, etc.).

Postcolonial Lens

Essential Question: How does this text comment on, represent, or repress the marginalized voices?

Central Concerns: cultural markers, the Other, oppression, justice, society

Critical Assumptions:

1. Colonization—the exploitation of one national or ethnic group by another—is a powerful destructive force that disrupts the identities of both groups.
2. Colonized societies are forced to the margins by their colonizers (called “Othering”), despite having a historical claim to the land they inhabit.
3. Literature written by colonizers distorts the experiences and realities of the colonized; literature written by the colonized often attempts to redefine or preserve a sense of cultural identity.

What to do:

1. Explore how the text represents a colonized or colonized cultural group.
2. Ask how the text creates images of “others.” How does it demonstrate a colonial mindset?
3. Ask how conflicts in the text might be viewed as cultural conflicts.

New Historicism Lens

Essential Question: What are the ways in which our understanding of literature and its historical context change over time?

Central Concerns: history as interpretation and cultural construction, literature as dynamic, meaning changes over time

Critical Assumptions:

1. Meaning is contextual.
2. There are divergent viewpoints on the nature of a historical context.
3. History is subjective.
4. Interpretation is a kind of cultural production, marked by a particular context; we cannot look at history objectively, as we too interpret events as a product of our culture and our time.

What to do:

1. Learn about the systems of meaning that were available to the author at the time the work was produced.
2. Consider the ways in which cultural concepts change over time.
3. List the ways in which contemporary events, assumptions and perspectives might shape one's reading of the literary texts.
4. Imagine the ways in which literary works influence reconsiderations of history.

Deconstruction Lens

Essential Question: How does analysis of this text reveal privileged oppositions of meaning and arbitrary nature of language?

Central Concerns: privilege, hierarchies, indeterminacy, sign, signifier

Critical Assumptions:

1. Meaning is not determinate: it is made by binary oppositions (yes/no, positive, negative, etc.), but one item in an opposition is unavoidably favored or privileged over the other.
2. The hierarchy is arbitrary and can be exposed or reversed.
3. Texts contain unavoidable gaps, spaces, absences, contradictions and irresolvable ambiguities that defeat complete interpretation.

What to do:

1. Identify oppositions in the text.
2. Determine which member in a given opposition appears favored, and demonstrate contradiction of that favoring.
3. Expose a text's inability to resolve its ambiguities.

APPENDIX M: Feminist and Marxist Literary Criticism Handout

Gender (Feminist) Theory / Social Class (Marxist) Theory**Gender (Feminist) Theory**

- Applying the philosophies and perspectives of feminism to literature (and life);
- Considering how gender impacts what we read and write, and how we understand the relationships between men and women and their roles in society;
- Explore gender as a social construction, where there are a variety of genders and ways to 'represent' or 'live' one's gender beyond stereotype;
- Identify the impact of the patriarchy on gender relations, roles and power dynamics through paying attention to patterns of thought, behavior and values in a text;
- There is no single feminist perspective, and is inclusive of all genders—however, gender theory acknowledges that the male perspective has been dominant in cultural development where women have been cast as the 'other' and put in 'object' positions without power.

Essential Question: How does this text reinforce, critique, or challenge definitions of masculinity or femininity?

Gender Roles: Gender roles, objectivity/objectification, representation, differences

Critical Assumptions: Any text cannot exist outside of a gender frame of reference; Historically, writing has been dominated by men (it is important for women to create feminine/feminist ways of writing); Differences among genders should be acknowledged and explored; Stereotyping is dangerous and can lead to destructive social norms.

What to do: 1. Consider the gender of the author, the reader, and the characters/voices in the text: how does the text reflect social gender codes; 2. Ask how the text reinforces or undermines gender stereotypes; 3. Imagine yourself as someone of another gender reading this work.

Social Class (Marxist) Theory

- Suggests certain people have advantages over others based on social, economic and political class resulting in an uneven distribution of power;
- A focus on the relationship between power and money: Who has money? Who doesn't? Who has power as a result? What quality of life do the characters have, and how does that connect to politics?

Essential Question: How does this text comment on or represent class conflict?

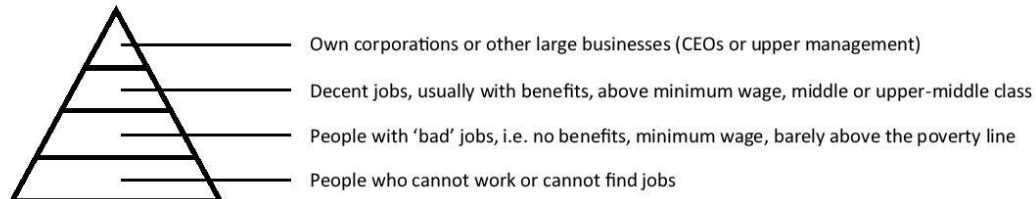
Central Concerns: power, economics, class, differences, fairness, society

Critical Assumptions: The way people think and behave is determined by basic economic factors; Class conflict is the same as political conflict; The wealthy class exploits the working class by forcing their own values and beliefs upon them, usually through control of working conditions and money; These ideas can be applied to the study of literature, which is a product of culture and social conflict.

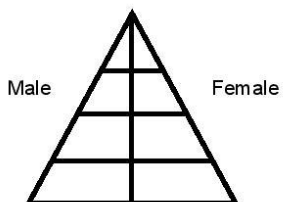
What to do: 1. Explore the way difference economic classes are represented in the text; 2. Determine the ideological stance of the text (Is it radical? Conservative?); 3. Link the text to the social class of its author; 4. Consider how the text itself is a commodity that reproduces certain beliefs and behaviours. What is the effect of the work as means of control?

APPENDIX N: Tim McCaskell Adapted Image Handout

Society and Class

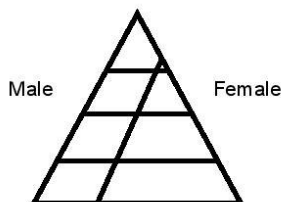


Gender—How it should be*

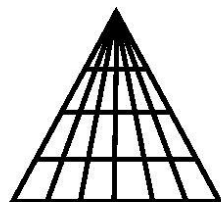


But because of sexism...

Gender—How it often is

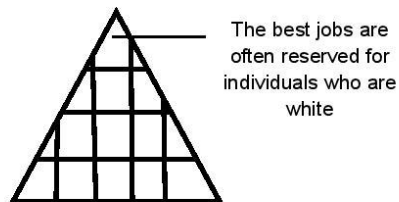


Race—How it should be

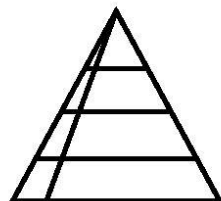


But because of racism...

Race—How it often is

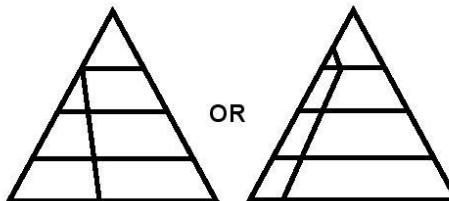


Sexual Orientation—How it should be*

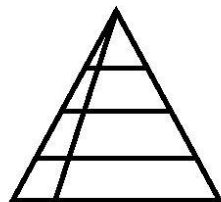


But because of homophobia...

Sexual Orientation—How it often is

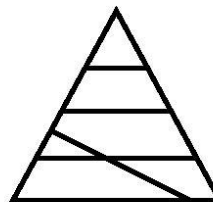


Disability—How it should be*



But because of ableism...

Disability—How it often is



*Martin Eigenberger's argument regarding the inequitable division of jobs as an illustration of unjust class difference along lines of gender and sexual orientation is limited - He uses only male and female as gendered identities, and only discusses gay and straight when considering sexual orientation and class division. This was a point of discussion during the lesson in which I used this resource.

APPENDIX O: Postcolonialism, Biographical Criticism and (New) Historicism Handout

Postcolonialism

· Identify patterns in relationships, class, and power that marginalize individuals who do not identify with the dominant culture, and acknowledge the histories of various power differentials along lines of race, culture, colonization, and prejudice.

Essential Question: How does this text comment on, represent, or repress the marginalized voices?

Central Concerns: cultural markers, the Other, oppression, justice, society

Critical Assumptions: 1. Colonization—the exploitation of one national or ethnic group by another—is a powerful destructive force that disrupts the identities of both groups; 2. Colonized societies are forced to the margins by their colonizers (called “Othering”), despite having a historical claim to the land they inhabit; 3. Literature written by colonizers distorts the experiences and realities of the colonized; literature written by the colonized often attempts to redefine or preserve a sense of cultural identity.

What to do: 1. Explore how the text represents a colonized or colonized cultural group; 2. Ask how the text creates images of “others.” How does it demonstrate a colonial mindset?; 3. Ask how conflicts in the text might be viewed as cultural conflicts.

Biographical Criticism

Essential Question: How does this text reflect the experiences, beliefs, and intentions of its maker(s)?

Central Concerns: context, systems of meaning, commentary, society, belief, self expression

Critical Assumptions: 1. Meaning is contextual; 2. Writing is a product of social, political, and historical forces; 3. Writing reflects the systems of meaning available to the author; 4. Interpretation of writing demands interpretation of its historical or biographical context.

What to do: 1. Research the author’s life, and relate that information to the text; 2. Research the author’s time—its historical, geographical, political, and intellectual moment—and relate that data to the text; 3. Research the systems of meaning available to the author, and relate those systems to the text.

(New) Historicism

Historicism

· Suggests context is important to the meaning of a text, and requires that readers analyze a text along the lines of history and culture.

New Historicism

· Not only is historical context important in interpreting a text, but it is also important to consider how concepts change over time—our contemporary experience of a text is different because of our experiences.

Essential Question: What are the ways in which our understanding of literature and its historical context change over time?

What to do: 1. Consider the ways in which cultural concepts change over time. 2. List the ways in which contemporary events, assumptions and perspectives might shape one’s reading of the literary texts; 3. Imagine the ways in which literary works influence reconsiderations of history.