Introduction

The goal of this research-through-creation project is to discover processes, creative decisions, considerations and techniques that facilitate the writing of a science fiction screenplay in relation to an existing futuristic phenomenon and the social and moral debate around it. The creative project at the heart of this research is the writing of a science fiction TV series pilot screenplay that deals with the subject matter of human enhancement: a developing technological domain that deals with modifying and/or augmenting human capabilities and functions, such as the cognitive, physical, health-related and/or emotional abilities and traits of the human being. There is a turbulent moral and social debate around human enhancement technology regarding its potential threat to human society and human nature on the one hand, and the merits and even the necessity of such technologies to humanity on the other (Bostrom and Savulescu, 2009).

The science fiction genre has a very important role in helping society to understand, frame and discuss how the world can and should be in face of today's rapidly changing world and the present and future evolvement of technologies that can change life, society and humanity, like human enhancement. Historian and futurist Yuval Noah Harari writes:

"At the beginning of the 21st century, the most important artistic genre is science fiction. Few are the people who read academic articles about Artificial Intelligence or genetic engineering. Movies like "The Matrix' and TV series like 'Westworld' and 'Black Mirror' are shaping the way most people think about the important technological, economic and social developments of our time" ("21 lessons about the 21st Century", p. 246, translated from Hebrew)

According to Noah Harari, this places a responsibility on the shoulders of science fiction writers to represent the real issues and threats that technological advances present, and not to plant the wrong ideas or steer

attention to secondary issues. In his eyes most of science fiction does not live up to this responsibility:

"Science fiction is occupied with the possibility of war between robots and people, while what should really bother us is a struggle between an algorithm-enhanced super-human elite and a lower class of weakened 'homo sapiens'." (p.247)

So, Yuval Noah Harari thinks there ought to be science fiction stories about human enhancement and its social consequences.

The major creative product of this creation-as-research endeavor is a TV pilot screenplay called "Trans-H", which tells the story of life in a time when people are beginning to be able to purchase enhanced capabilities. In fact, there is more than one creative piece another, earlier pilot screenplay called "California Republic" and an intermediate series synopsis called "California Nation". The research follows the progression of the work from the first attempt to the final one, the creative decisions made, the writing and the re-writing, the studying of the knowledge about human enhancement, science fiction theory and of other films, series and novels, and how this newly gained knowledge has affected the writing. The insights gained from this process and the reflection upon it are offered as conclusions and guidelines to the initial question of how to dramatize a futuristic debate into a science fiction screenplay.

This is not a conventional academic dissertation. It uses the unorthodox yet growing use of research-through-creation or creation-as-research (or practice-led research, Green, 2006). Haseman (2006) called this "performative research". Skains (2018) claims that practice-led research has been very common in engineering, medicine and design, and lately has started to evolve as a research method in creative writing. She describes the essence of practice-led research as:

"Practice related researchers push this examination [the study of art, e.b.m]into a more direct and intimate sphere, observing and analyzing

themselves as they engage in the act of creation, rather than relying solely on the dissection of art after the fact." (Skains, 2018, p. 84)

Mayers (2016) has described how the field of creative writing research has evolved considerably in the decade prior to his publication, with more writers-researchers publishing articles, emergence of new doctoral programs in creative writing, the foundationof associations and dedicated journals and the publication of several books which solidified the foundations of the field.

One of those books is Jane Webb's "Researching Creative Writing" (2015), where she presents a conceptualization of what can be the goal of research-through-creation:

"In the best cases, writer-researchers will deliver a fine piece of writing, an improved understanding about some aspect of professional creati practice and a new way of seeing the world" (quoted in Hedengren, 2016)

One of the more common methodologies for conducting research-through-creation is the use of reflective research (Green, 2006; Skains, 2018). Alvesson & Skoldberg (2000) define reflective research as interpreting one's own suppositions and subjecting one's own assumptions to critical review. The subjects of the reflection process could be practices. assumptions, conceptualizations, considerations and decisions. The reflective research of the artist tries to capture the internal process of creating, which is always unique and non-recurrent, and difficult to approach from the outside by other research methods.

There are probably over a hundred doctoral programs in creative writing today, among which are those offered by high ranking institutions such as Cornell University, University of Southern California, King's College of London, University of Edinburgh, University of Melbourne and more.

Creative writing dissertations are usually composed of two complementing components: a creative piece and a critical essay. The relations between the two parts are usually decided by the logic and the rationale of the project and the research. The critical essay should not stand on its own and must gain its meaning from its relation to the creative work. The creative piece should, of course, have value as a work of art regardless of any further explanations or interpretations. However, when it is part of a practice-led research, it is valued also for the insights and the learning that can be gained through it. Hence, reading the critical essay should also shed light on other layers of meaning that the creative piece offers, such as evaluating creative decisions and techniques used in the writing, and understanding the work in its creative context and in the context of the larger theoretical study that took place.

The structure and order of this dissertation is as follows:

Part 1 of the doctorate reviews the subject of human enhancement. It includes a review of the existing technology, the types of technology that can emerge, a brief review of the history of human enhancement and some evidence from science fiction and other sources to the interest that the subject creates. It then finishes with a review of the moral and social questions and debate about the subject.

Part 2 studies science fiction theory. It starts with looking at the major definitions, characteristics and impact of the genre, then covers theory and knowledge about science fiction writing and reviews some of the more known science fiction creations that deal with human enhancement in literature, film and TV (with a slightly greater emphasis on film and TV, since they are the result of screenwriting and similar in medium to this project) and then reviewing the current science fiction TV landscape.

Part 3 delves into the creative process, following it more or less chronologically from the emergence of the idea to write about human enhancement, through to the writing of the different drafts. Part 3 is

written in a multi-perspective way, combining description of decisions, thoughts and products of the creative writing process, along with reflection on insights, self-evaluation, auto-criticism and interpretation. It uses evaluations from outer sources and offers a conceptualization about science fiction writing in the line of this creative process.

The creative pieces are presented after the critical essay in the chronological order of their creation with the first pilot screenplay going first, the intermediate series synopsis second and the final pilot screenplay third.

This dissertation has a structure because it must have one. However, reading it can be done in a different order than the one presented. It is possible to "jump over" and begin straight with the screenplays, reading the last screenplay first or otherwise. I would recommend reading the screenplays either before reading the essay, or stop reading the essay before part 3 (or on the points in part 3 where I suggest reading the screenplays), then read the screenplays and only afterwards continue reading part 3 about the creative process.

The order in which the doctorate is arranged is not the order it was written, and it is not the order of the actual process. The meeting point of art creation and research is difficult to represent linearly because of the nature of the creation. Shklovsky (cited by Bordwell, 1991) referred to the creation of art as the knight's move in chess, which is the only piece that does not move in a linear way and can jump over other pieces. If you wished to try and read it similarly to how it took place in the entire research-through-creation process, it would go roughly like this:

1. The beginning of part 3 about the emergence of the idea

2. Some of part 1- to learn a little about human enhancement

3. "California Republic" screenplay (the first pilot)

4. Review and self-evaluation of the first screenplay (part 3)

5. A little more reading about human enhancement (part 1)

6. Analyzing science fiction TV shows (the end of part 2)

7. Learning about science fiction (part 2)

8. "California Nation" synopsis

9. Review and self-evaluation of the synopsis (part 3)

10. More study about science fiction theory, and especially about writing (part 2)

11. Learning more about human enhancement and more about the debate (part 1)

12. Reading the part about "lateral work" in the creative process (part 3)

13. "Trans-H" screenplay

14. Review of the screenplay

15. Conclusions

So, the process of creative writing research is very dynamic and involves a lot of moves between writing, evaluating, reflecting, studying, conceptualizing, and all these steps "feed" and influence each other. This will be discussed further in part 3.

Throughout the parts of the essay I try to briefly explain why every chapter was important for the writing process or at least for the research.

Extended introduction: research approach and methodological framework

The research question and its underlying disciplinary assumptions

The main question that this work is trying to answer is what is the creative process (creative decisions, considerations, challenges, conceptual framework) involved in writing a science. fiction TV series about a morally, psychologically, philosophically and socially charged technological subject in this case, the technological domain of human enhancement. However, the question and its answers are applicable to the dramatic treatment of other emerging technologies and can serve as insights and guidelines that can help writers and researchers of science fiction.

At its core the research question is routed in the field of creative writing research (Alvesson & Skoldberg, 2000; Dawson, 2004; Smith & Dean, 2009; Webb, 2015; Brien, 2006; Green, 2006; Haseman, 2006; Haseman & Mafe, 2009, Skains, 2018; Sullivan, 2009) and its sub-field of the research of screenwriting (Baker, 2013, 2015: Batty et al, 2019: McAulay, 2017; Mathews, 2018). However, the assumptions underlying this question and its potential contribution crosses the boundaries of creative writing research:

★The social role and impact of the TV series medium in current days and culture, and especially of science fiction (which will answer why using the TV series medium for this research).

★The research of science fiction as a genre and as a narrative art.

★Philosophy in the narrative arts.

★Screenwriting.

This document will review the above mentioned disciplines in relation to the research question, describe in more detail the methodology of

creative writing research (with an emphasis on screenwriting research) and discuss the conclusions and their possible contribution to the different disciplines that this research is related to. The discipline of screenwriting will be addressed, as part of the chapter about creative writing research.

An important note: This research is the meeting point of several perspectives and disciplines. As mentioned, it is primarily a research into the creative writing process, but it corresponds and draws its assumptions from several fields of research and schools of thought.

One implication of the above-mentioned note is that the way most of the disciplines are related to the research is by looking at them from the different perspectives that the meeting of disciplines allows. For example: The contribution to the research of the science fiction genre is done by viewing the genre not from the conventional perspective of analyzing the completed work, but from the perspective of the process of creating a science fiction story and how the concepts that are used to research science fiction as a work of art (such as the "novum", Suvin, 1979) can be used to write it. The contribution to the philosophical debate about human enhancement is not done with the use of conventional philosophical tools, but through expressing this debate using dramatic and screenwriting tools and translating it to the form of a TV series screenplay.

A second implication is that this research creates its own unique combination of conceptual system or "space", not "following" or "continuing" any one specific disciplinary discourse and research system, but rather "fuses" tools of creative writing (screenwriting), creative writing research, science fiction, philosophy (of human enhancement) in light of the research question and the creative challenge. This is common in the relatively young field of creative writing research, as we will see later in a chapter about the Creative Writing Research approach.

Theoretical assumptions to the research approach

It can be said that the approach to this research draws on assumptions from the post-structuralist view of the art and society (Bourdieu, 1972, 1984) and from the systems theory philosophy (Laszlo, 1972), such as:

★Artifacts (such as creative works and intellectual products) are created and can be evaluated only in a context. In relation to this research, this assumption has two meanings: (a) The use of the science fiction TV series medium as a creative work is and should be situated in the context of the contemporary TV series world, the contemporary science fiction world, today's culture and its relation to technology and the future, audience's expectations, the eco-system of TV series production & consumption, the current theory of science fiction and so on. (b) The research. presented about the creative process in this dissertation is also a composition created in a context (which is the heterogenic disciplinary origins of it).

★Meanings are the result of underlying conceptual systems. This assumption is central to the entire research into the creative process in this dissertation, since the central endeavor presented is to elicit a system for the creation of a science fiction TV screenplay, and assuming that a story is not just a series of events, but rather a composition that is built on a covert system of constructs (such as theme, premise, values, genre tropes and conventions, antagonism forces and so on). This approach to storytelling and screenwriting is evident in screenwriting teacher John Truby's work (2009).

★A system is defined by its components and their inter-relatedness. This notion, drawn from systems theory (Lazslo, 1972), might be aligned with post-structuralist ideas as well. Its meaning is that things affect each other in complex ways and the actual phenomena is the product of these inter-relations. This assumption influences this work on three levels: (a) As an approach to creative writing it places an emphasis on the relationship between the components that

are at the basis of the story (ie. the choices of character, obstacles, genre, pace, style, symbols, locations etc. form a story through the relations between them). (b) As an approach to the research of creative writing it implies looking at the creative process by its relatedness to the different factors that influence it (science fiction theory, the landscape of TV and science fiction TV, the background and psychology of the writer etc.). (c) As an approach to the study of film and TV it places an emphasis on the interactions between creative works, genres, audience and socio-cultural reception the ways a novel, a film or a series is perceived, understood, interpreted to the moral, psychological and social questions and dilemmas that the advancement in human enhancement technology can incite.

(b) Stories can provide philosophy and philosophical thought a "large scale and holistic simulation" of the philosophical inquiry. When writing a story, the writer creates a complete system of characters, locations, motivations, events, values, institutions, ecology and so on, and this could serve a thought experiment in developing philosophical ideas on a systemic level. The use of the word "holistic" means that in a story the philosophical issue is not isolated when dealing with a moral question, the story can tand even must) refer to the emotions, value systems, impact on others and so on.

Here is an example from "Trans-H", the screenplay written for this research: One of the philosophical issues of human enhancement is the danger of growing inequality between the enhanced and the non-enhanced (Noah Harari, 2018). In "Trans-H", a character called Sierra Newman builds a company that manufactures very expensive implants that can boost cognitive abilities. She claims that the results of using the implants will provide people with better abilities. It will induce them to develop technologies that will benefit all the people, like medical technologies, improving climate issues etc. However, one of the consequences of the new industry is having people who cannot afford the implants feeling they become second-rate citizens. This, in turn, leads to the evolvement of a pirate

industry of cheap implants that people take with risk. When a girl whose parents wanted her not to be a second-rate person bought her such an implant enters a state of coma-Sierra now has to face emotions of guilt about a reality that emerged as a consequence of her actions. The same event also raises a demand for heightened regulation over enhanced people and her company. The ability (and even necessity) to explore all kinds of consequences, dimensions and inter-relations deriving from an issue is a tool that storytelling, and especially the TV series medium with its wide canvas, can offer.

Following the second point, a more daring claim can be made that under certain conditions the writing of a story, expecially science fiction, is in itself an act of philosophical research. When a writer needs to connect and invent a coherent system that incorporates events, characters, motivations, emotions, a story world built with an eco-system, institutions etc., the creation of such a system, if successful in being coherent and related to the theme, demands philosophical reasoning (which is sometimes conscious for the writer and sometimes intuitive and hard to explain) and can contribute its rules and relations to the philosophy, This is why many stories become the source of philosophical investigation.

One of the contributions of this dissertation consists in gaining insight into the process of writing a story that is created with the intention of expressing and simulating a philosophical issue. Derivative questions can be: How does the study of the philosophy contributes to the development of the story (if at all)? How does the "translation" of a philosophical issue into the form of a TV series screenplay reflect on the philosophical issue and helps look at it differently?

As with the prior disciplines discussed most of the academic work linking berween philosophy and storytelling is done in relation to the completed work of art, and the perspective of its creation is relatively missing. Applying the methodology of the creative writing research to this subject can begin to provide insights and concepts to this aspect.

Creative writing research

Because this research is a creative writing research, and because this is an atypical and relatively new academic field, it is important to devote a chapter in this document to the development of this field and its methodologies.

This chapter will refer to:

★The emergence and assumptions of creative writing research, and its academic eco-system.

★The main research methodologies of creative writing research.

★The screenwriting as a discipline and this research potential contribution to it.

★Screenwriting within the field of creative writing research.

This chapter will provide a needed forward to the next chapter that will elaborate the methodology of this research.

The paradigm of creative writing research

At the beginning of the introduction there is a quote by Skains (2018) that describes the essence and the goal of creative writing research (which is a "practice-led research" approach applied to creative writing):

"Practice related researchers push this examination [the study of art, e.b.m] into a more direct and intimate sphere, observing and analyzing themselves as they engage in the act of creation, rather than relying solely on the dissection of art after the fact." (Skains, 2018, p. 84)

The meaning of this claim is that while most of the academic research in art is based upon the hermeneutic tradition of interpreting the text by trying to reconstruct the meaning that. was in the mind of the creator, and assuming that the impact of art is the way this meaning is interpreted

by the audience of the creation and through this interpretation triggers a change in the audience's mind (Schleiermacher, 1819/1978: Schleiermacher in Palmer, 1969; Heidegger, 1950, Gadamer, 1960; Ricoeur, 1973, 1981; Bowie, 2003)-hence views the product of art from the outside and as a completed work, the creative writing research seeks to explore the space that exists between the writer and the work. In this sense, the creative writing research aims at completing the hermeneutic tradition with praxis.

The usage of the concept of praxis has grown in the philosophical and intellectual discourse through the work of Hannah Arendt (1958). Arendt placed a great deal of emphasis on the actions of people and on the "theory of action" that guides them, meaning the assumptions, interpretations and understanding of the world, which can be dynamic, that through which the person forms an intention and acts upon it. Arendt, and also Freire (1970), used this term mainly for political action, referring to the process by which people reach a perception of the political situation and decide to act upon it to achieve a change. However, the concept of praxis can be used in many domains (Lanir, 2013). Drawing on the works of Arendt and Freire, the praxis can be shared or discussed, meaning that as a knowledge it is not just a personal knowledge, but a subject of exploration and discourse.

The meaning of the praxis concept also resembles to some extent Bourdieu's "theory of practice" (Bourdieu, 1972; Bourdieu & Wacquant, 1992), by which a person can use his "practical sense" and methods of reflection to understand the system (or the "game") in which he operates.

Praxis is a term that combines action and reflection (Freire, 1970). Its development is based on action in the natural and social world (Scott and Marshal, 2009) and involves a cycle of taking action, reflecting on both the results and outcomes of the action and the assumptions and understandings that preceded it, then changing or adjusting those assumptions if needed and using the new understanding to take the next action.

The philosophical term of praxis is very close to terms from cognitive psychology, such as schema (Piaget, 1923) and heuristics (Simon, 1947; Kahneman & Tversky, 1982). Both these terms refer to the internal concepts a person holds, which can be explicit or implicit, that he uses to solve problems and make decisions. The lessons from cognitive psychology suggest that the praxis can evolve in the process of acting and reflecting (Kolb, 1983).

Creative writing research (and the entire practice-led research domain) is a field of research that mainly deals with the praxis of storytelling. This means that it involves action-writing a story, and reflection into the creative process, combined with an appraisal of the work, to generate knowledge about the creative process in the context of the creative challenge. The underlying assumption is that the knowledge created through this methodology can be shared and contribute to other writers and researchers of the creative process. It might also be valuable to the academic discourse about the subject matter of creation by completing the knowledge created through the hermeneutic tradition with insights from the praxis of the art (for example: the study of science fiction can be comprised of the study of completed works and the study of the creative process of a science fiction story).

Another foundation for creative writing research, that might offer a more unifying approach that relates to both hermeneutics and praxis, can be found in the Csikszentmihalyi system's model of creativity (1996):
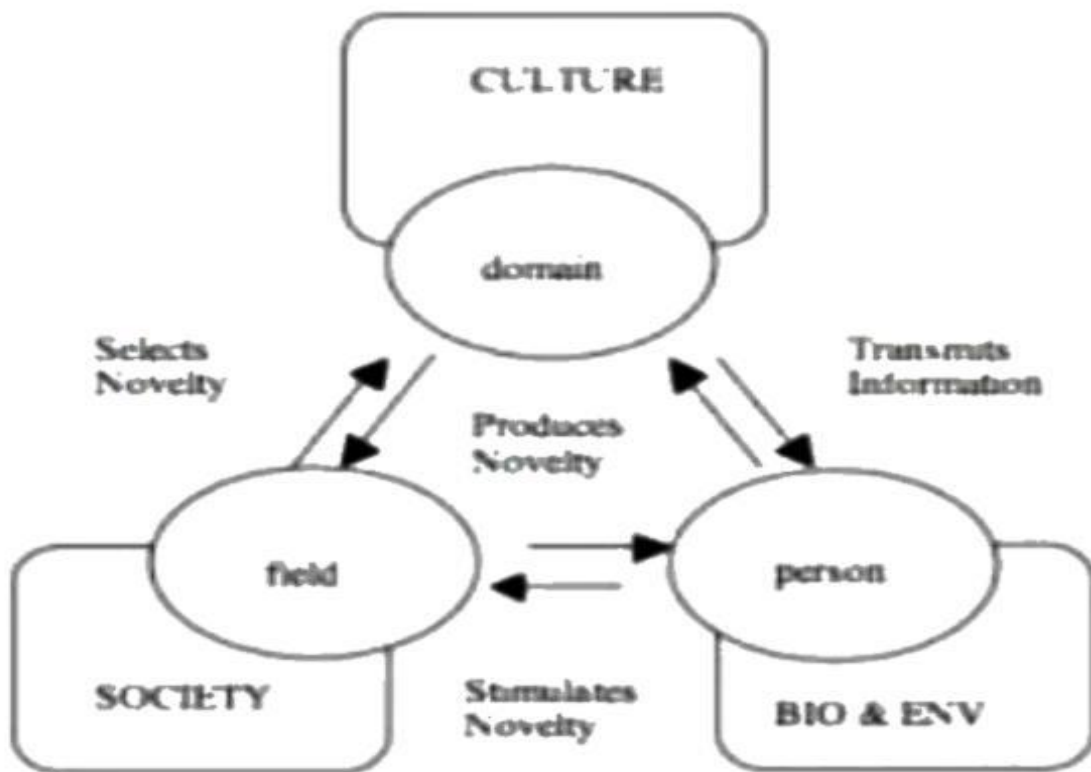
Csikszentmihalyi views creativity as occurring in a system or a context, in which the creative person gains knowledge of a domain, rearranges connections or concepts in that domain and transmits it back to the domain (through the mediation of society) and hereby changes it. Applying this systemic model to creative writing research means that the writer-researcher is not only reflecting on his own mind, but also examines and relates to the context and the domain in which he operates as an input (how the genre, the eco-system. etc. influences his writing), and at the same time an output (envisioning the social reception of his work and uses it as a source in his creation). A similar idea can be found. in the "cognitive process model of composition" (Flower & Hayes, 1981), that suggests looking at the artist's creative process as made of three cognitive elements: (a) The artist's knowledge of the topic in which he wants to create (genre, subject matter, context, audience etc.), (b) the task environment. (c) the creative process itself (planning, the actual work etc.). Flower's and Hayes' model can serve as a framework for accessing the content of the creative writing research investigation,

The methodology of creative writing research will be discussed in more detail later in the relevant chapter, and in the chapter describing the methodological approach in this research.

Creative writing research as an academic discipline

Creative writing programs have existed in the academy for a long time, however the discipline of creative writing research as a recognized institutional academic field is rather young. In the "Creative Writing Research Benchmark Statement" published by the British national association of writers in education (NAWA) in 2018, it is noted that the first British doctoral candidate in the field received his doctorate in 1990. The field has grown fast with Harper estimating in 2008 that in the United Kingdom there are 400 active doctoral students in creative writing research. On the same year Boyd identified 199 completed doctorates in creative writing research in Australia between 1993-2008. Those numbers don't take into account the number of doctorates done in the United Stated, which might be larger due to the greater number of universities offering this option.

In more than a decade since, the field has grown even more, and today most of the universities in Great Britain and Australia, many universities in the United States and some in other countries offer doctoral programs in creative writing research.

Following is a list of a few of these universities, along with links to the descriptions of the programs (The list has been screened to include mainly universities which' websites are more elaborated):

In most cases the creative writing PhD is part of the literature of the language departments, and in some cases, it is linked with programs of communication and media arts.

In the past creative writing researchers who wanted to publish articles turned to journals about literature, culture, communication and media (which is evident in the bibliography of this work). This is still the case,

but in the past decades, established several academic and peer reviewed journals were dedicated to creative writing research:

https://www.tandfonline.com/loi/rmnw20

New Writing: The International Journal for the Practice and Theory of Creative Writing

https://scholarworks.rit.edu/jcws/

Journal of Creative Writing Studies

https://textjournal.scholasticahq.com/

TEXT: Journal of Writing and Writing Courses

Upon completion of this research, it might find a stage for publication in either one of the above-mentioned journals (who also cover the research of screenwriting) or in journals dedicated to the research of television, film and science fiction.

As a relatively young and emerging field, there have been several scholars who try to portray its boundaries and characterize it as an academic and research discipline (Webb, 2015; Donnelly, 2009; Dawson, 2004; Barbazon & Dagli, 2010; Harper, 2007; Kroll, 2012; Mayers, 2016; Suya Lee et al, 2016; Smith & Dean, 2009). Much of the principals developed through their collective works about the foundations of the field is summed up in Derek Neal's "Creative writing research benchmark statement" from 2018, done in behalf of NAWA. The benchmark statement defines the field of creative writing research and provides guidelines to its assumptions and methodology, as well as guidelines to PhD candidates and supervisors in the field. Here are some of the points made in the statement:

"The most common mode of Creative Writing research is creative practice. Creative practice research can include a range of methods, approaches and styles, including those variously labelled as practice-led research, research-led practice, practice-based research and practice-as-research. The commonality in all types of creative practice research is that the researcher produces a creative work. The process of artistic practice and its resulting output are perceived as contributions to knowledge.

In most higher education institutions in the UK, but not all, creative practice research also involves the production of a critical investigation and often a critical, reflective or analytical output. Such outputs can relate to any aspect of the creative work or process.

Creative practice research entails research into the process of artistic production, often called the creative process, though it may embrace multiple processes. In this sense, the making of the work itself forms research into the way that it is composed, and the way it is presented, its content, form, craft, and technique.

Research is also manifest in investigation into contexts related to the creative practice. This contextual investigation might be historical, cultural or literary or involve various interdisciplinary investigations. In this way creative practice research. the artistic process and/or the critical reflection can engage with a range of theoretical positions and disciplinary areas.

Though varieties of critical research might also be undertaken, creative practice research primarily uses the act of writing to explore, articulate and investigate new branches of knowledge and understanding.

Creative practice research can result in critical works, and these can be connected to, combined with, embedded within, or stand relatively free from, the practice that informs them. However, there is usually at least a symbiotic link between the two; they are often in dialogue with one another and in effect pose questions, which are reciprocally addressed.

The research is often fluid and responsive, the creative writer utilizing emotional, intellectual or psychological stimuli to shape their work in mutative ways that may be difficult to plan for or predict.

Creative Writing is not primarily a vehicle for what may be termed 'factual knowledge, but a synthesizing process that brings about both knowledge and emotional awareness through imaginative interpretation and representation of experience.

The actions of Creative Writing research inherently include investigations and explorations both in and of creative practice, whereby experience is transmuted into language."

Methodologies of creative writing research

As described before, the creative writing research attempts to create knowledge on the praxis of the creative process. The basic modes of research are action (practice) and reflection. Around this foundation, there could be many variations and methods.

The things that separate the creative writing research from just the practice of creative writing are (based on Neal, 2018, and Skains, 2018):

1. It is a process that begins with a question or a problem. The question/problem can be about the creative process itself, the genre, the rules or symbols of the art form, the situation and circumstances of the writer, an external subject matter that becomes the subject of writing and more.

2. Throughout the creative-research process there are deliberate actions that are directed at expanding the knowledge around the question/problem (these might include reflection and/or auto-documentation, studying, consulting, attending workshops or undergoing specific experiences and more).

3. The writer-researcher evaluates and interprets data he documented or collected in the course of the writing (thoughts, insights, intentions, decisions, actions, attempts etc.) in light of the question/problem.

4. The "output" of the work conveys not just the artistic work, but also communicates in some way the knowledge and insights gained about the question/problem. This can be done in the work itself, but the convention of the field is the writing of an exegesis or critical essay that accompanies the creative piece.

Creative writing research "belongs" to the methodological family of qualitative research.

Flick (2007) characterizes qualitative research as follows:

•"...to understand, describe and sometimes explain social phenomena "from the inside in a number of different ways:

•By analyzing the experiences of individuals or groups. Experiences can be related to biographical life histories or to (every day or professional) practices; they may be addressed by analyzing everyday knowledge, accounts and stories.

•By analyzing interactions and communications in the making. This can be based on observing or recording practices of interacting and communicating and analyzing this material.
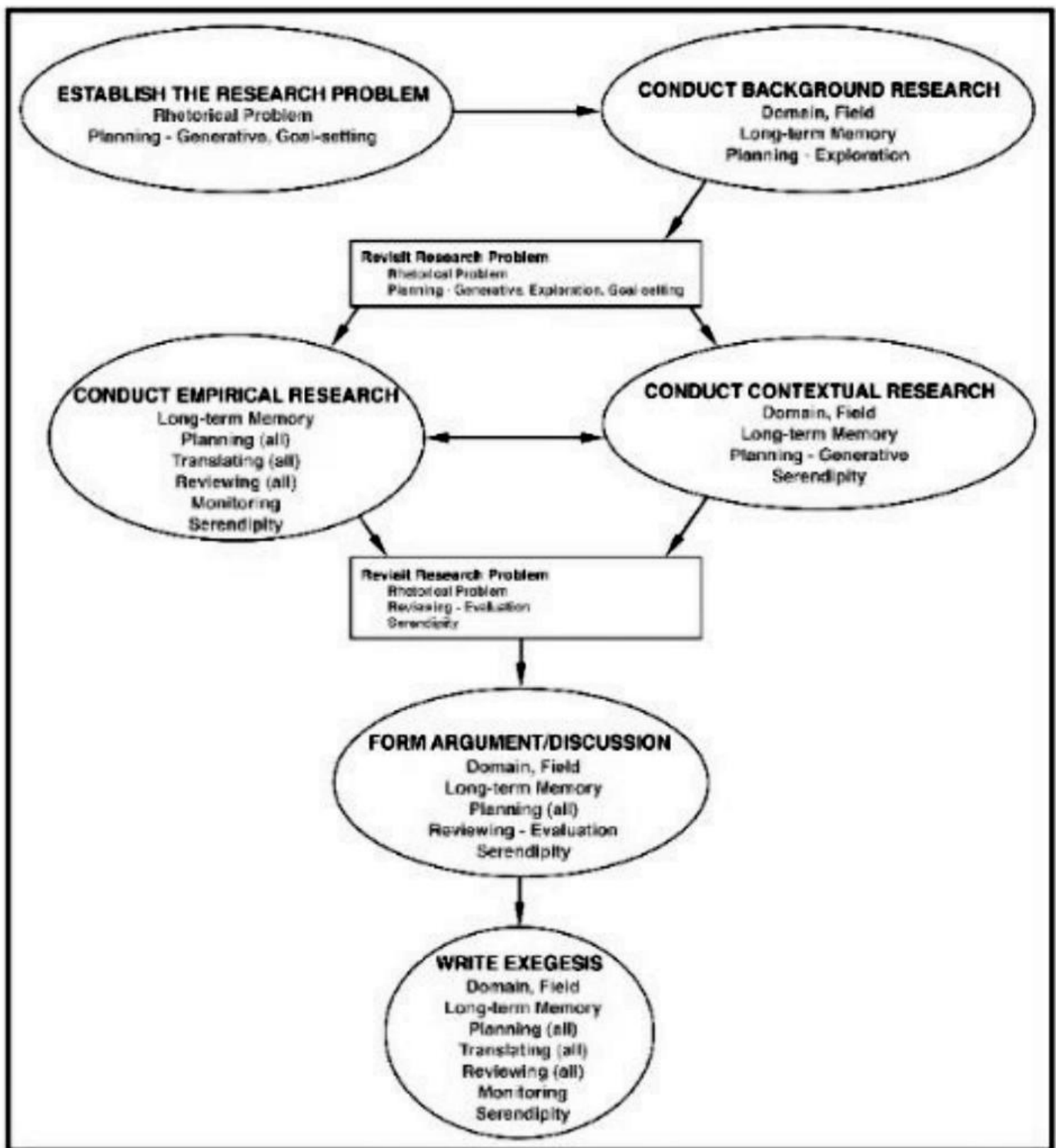
•By analyzing documents (texts, images, film or music) or similar traces of experiences or interactions," (Flick 2007: p. ix)

Creative writing research shares the definition of understanding the phenomena (of creative writing) "from the inside and operates by the first (analyzing experience) and the third (analyzing documents) categories that Flick portrayed.

However, creative writing research is different in nature from more traditional types of research and contains characteristics and limitations that need to be acknowledged. One of which is that the course of research is influenced by the dynamic nature of the practice-the creative process (this is also true in other practice-led research fields, like in engineering, design, medicine and others). The creative process isn't linear and cannot be accurately planned at its beginning. Therefore, a research done around it needs to have a framework that allows for the creative process to take its course, while being loyal to the process of generating knowledge that answers the question/problem (the question/problem itself might change throughout the process).

Such a framework can be found in Kurt Lewin's "action research" (1946) paradigm, which is done by taking "a spiral of steps, each of which is composed of a circle of planning, action and fact-finding about the result of the action". Lewin developed this method for social sciences, yet its principles of switching hetween action and research (or sense-making) apply nicely to the needs of creative writing research.

Skains (2018) have tried to combine the different elements of creative writing research discussed, along with Csikszentmihalyi's and Flower's and Hayes models to form a cohesive framework for creative writing research:

ESTABLISH THE RESEARCH PROBLEM
Rhetorical Problem
Planning - Generative, Goal-setting

CONDUCT BACKGROUND RESEARCH
Domain, Field
Long-term Memory
Planning - Exploration

Revisit Research Problem
Rhetorical Problem
Planning - Generative, Exploration, Goal-setting

CONDUCT EMPIRICAL RESEARCH
Long-term Memory
Planning (all)
Translating (all)
Reviewing (all)
Monitoring
Serendipity

CONDUCT CONTEXTUAL RESEARCH
Domain, Field
Long-term Memory
Planning - Generative
Serendipity

Revisit Research Problem
Rhetorical Problem
Reviewing - Evaluation
Serendipity

FORM ARGUMENT/DISCUSSION
Domain, Field
Long-term Memory
Planning (all)
Reviewing - Evaluation
Serendipity

WRITE EXEGESIS
Domain, Field
Long-term Memory
Planning (all)
Translating (all)
Reviewing (all)
Monitoring
Serendipity

Skains uses the term "conduct empirical research" for doing the actual practice of writing combined with documenting contents that emerge in the cognition of the writer. She advocates including auto-ethnomethodological methods in the course of the writing-research (such as conducting a writing journal, and documenting self-remarks), and also a step consisting in evaluating the finished work "from the outside".

A major take-away from Skains model is its nature as a dynamic process and that even the research question is revisited and most likely even rephrased throughout the process.

Another methodological model for creative writing research is proposed by Boyd (2009). Boyd also seeks to adjust the needs of research to the erratic nature of writing. She uses the term "strange loop" proposed by Hofstadter (1979) to organize the writing-research process. A "strange loop" means a cyclic movement through various levels, which relate to each other in a tangled hierarchy. Moving in a "strange loop" means that one can find himself at the starting point again throughout the process and doesn't necessarily knows if his next move is "upwards" or "downwards" and might be both in some senses. The "strange loop" differs from a spiral by that the "up" and "down" are not clear, and by that it is made from a tangled hierarchy of levels (for example: in creative writing all the different components from the Csikszentmihalyi's model could serve as a "level" as the writer "visits" levels of craft, subject matter, theme etc.). Every "movement" in the loop can be viewed as a cycle that incorporates actions on different levels.

The way Boyd describes the methodology she proposes is as follows:
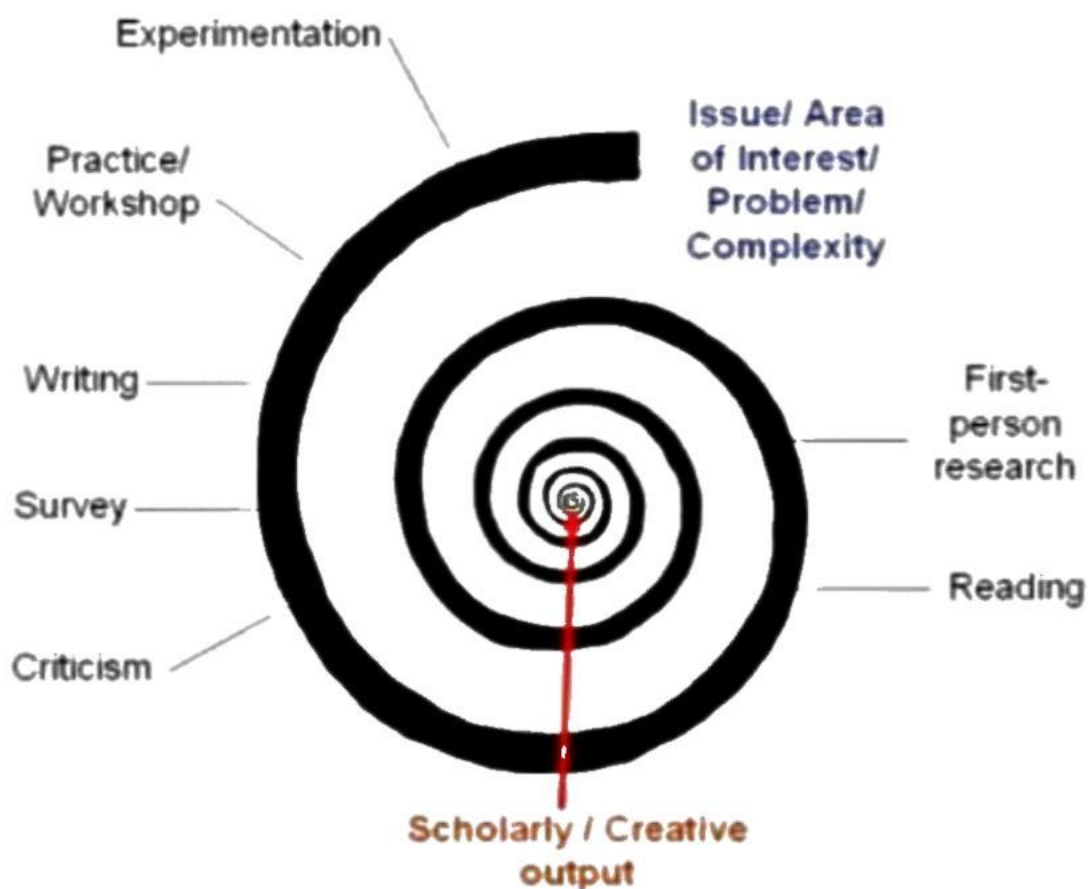
In a simpler, more lineat way, Boyd suggests the following steps in a creative writing research

"1. Specify an area areas of interest, problem and/or complexity, acknowledging these may change as a result of the research process

2. State an initial intention of what will be included in the first Joop of the research (eg. writing, reading genre, reading theory, experience, sketching, survey)

3.Conduct the research

4.Add or subtract items in the research "loop". Steps 1-4 will spiral the researcher toward a closer understanding of the boue

5. Restate the area or areas of interest, and

6. Reiterate and refine until the output is complete."

One important emphasis that Boyd suggests over Skains' methodology (which shares many features, and differ in some aspects and points of view for example Skains greater emphasis on the cognitive process of creation) - is the use of changing but planned actions that the writer takes throughout the process, such as going to a workshop, reading theory. watching and analyzing other creations etc.

The discipline of screenwriting

A major field that this work could contribute to is the domain of screenwriting teaching and theory. Screenwriting theory for the most is a professional discipline, not an academic one. There is an abundance of books, thenties, courses, webinars and other instructional materials, which are meant for screenwriters in all stages of their careers. This knowledge world is targeted at the purpose of writing good screenplays with "good" usually refers to the commercial value of the screenplay, and sometimes also to its artistic value.

The way this knowledge has been created resembles the two perspectives covered earlier regarding the research of art and stories: (a) analyzing films and TV series for their attributes and then translating this observation into an organized theory about how to write a good and/or commercially effective screenplay. Most of screenwriting theorists who

use this approach are not screenwriters themselves (Campbell, 1949, Field, 1979, Hauge, 2006;Seger, 1987: Vogler, 1992, Truby, 2009). The fact that these story theorists not screenwriters themselves does not mean their conceptualizations are any less good than others, it only meam they employed a method of analyzing films, series and screenplays to form their theory (it is important to mention that many of those theorists have worked extensively as consultants to screenwriters, so most likely have also gained understanding about the creative process itself although it is always an "outsider" point of view). (b) creating the knowledge about storytelling from a personal experience as a writer, coming up with concepts that the screenwriter used and found helpful. Notable screenwriters theorists are Snyder (2005), McKee (1997), Russell (2018), Bork (2018), Bonnet (2006). This method of creating knowledge about storytelling is similar to creative writing research, only done not under an academic framework and differs in the way it defines the goal of the work producing knowledge that will help writers write better and more sellable screenplays, as opposed to creative writing research that is aimed at gaining insight into the conceptualization of the writing process in relation to questions that deal with better understanding phenomena and processes of art, culture and creation.

Another rough way to categorize screenwriting theories is hy their overall approach to storytelling. There are two very general approaches: (a) "sequential" story theories that are focused in identifying and portraying the effective sequence of events that will make the story effective to audiences. The concept of three-act stracture, greatly influenced by Aristotle's "Poetics", is probably the most famous and recognized sequential story theory, Other story theorists whose work can be described as belonging to this group are McKee, Snyder, Field, Vogler and Campbell (the last two are known for promoting the "monomyth" approach to storytelling) (b) "systemic story theories that are focused more on the internal structure that underlies beneath the actual step-by-step layout of the story. These approaches place greater emphasis on the designing of the story components, like the characters, their relations, their motivations, the obstacles and the rivalries in the

story. the exploration of the theme, the use of genre conventions and so on. The approaches of Truby, Burk, Russell and Bonnet can be characterized as such.

These two roughly categorized approaches share one strong hasic assumption that there is an internal structure to good storytelling that needs to be identified. In this sense, the majority of the screenwriting theory world is influenced by the structuralist school of thought.

When it comes to writing a TV series the number of dedicated story theories decreases (although with the growing popularity of this medium this gap is starting to fill up). When considering the applicability of story approaches to TV series, the "systemic approach seerns to have a clear advantage, since most of the "sequential" approaches are designed mainly around the length and dynamics of a feature film for maybe a novel). A TV series, by nature, is a much longer, more branching story (see for instance a sample of branching narrative patterns: https://prea.com/a/ofercia, ax/interactiveating), not as "tight" and "lean" like the film. It is much harder to form a "sequential approach to current TV series that stretches to seasons. The three-act structure, for example, or Snyder's "beat sheet", might cover an episode, but the series story of today is less and less episesdical. The "kystemic" approach allows for the design of dynamics and "story engines which can support a semon or more. This could be the reason why out of the notable screenwriting teachers, two who are also known more than others for their explicit work on TV series storytelling come from a more "systemis approach-Truby and Russell.

As for screenwriting in science fiction very few story theorists and teachers have referred directly to writing science fiction and even fewer to writing science fiction TV series. Again, the two that appear in this niche as well are Truby and Russell.

Therefore, the contribution of this work to the knowledge world of screenwriting is by broadening the scarce existing knowledge of science fiction screenwriting, and moreover of science fiction TV screenwriting. It can also contribute by putting to use some principals of TV screenwriting (mainly by Truby and Russell), and learn about the use of it in creating the series which is part of this work

Screenwriting in the academic creative writing research field

Within the field of creative writing research exists a niche that deals with screenwriting. Some of the journals of creative writing research have dedicated issues to screenwriting research: "New Writing: The International Journal for the Practice and Theory of Creative

Writing" (volume 13.1, 2016); "TEXT: Journal of Writing and Writing Courses (volume 19, 2013).

Batty (2016) described that many of the screenwriting research up to that point linked screenwriting to other subject matters (for example: sociological contexts) and called for more research on the actual screenwriting work..

Batty and McAulay (2019) define the screenwriting research practice as followed

> "a practice in which the screenwriter makes use of the intellectual space offered by the academy and those within it to incubate and experiment with ideas, with the intention that their processes or their screenplays or both-change as a result."

The 2013 issue of "TEXT" dedicated to screenwriting published several screenplays that were written as research. Each of these screenplays was written with an intention to explore the execution of pre-defined goals and subjects, such as memoirs (Baker, 2013), the news broadcasting

manipulation to grow audience (Batty, 2013), a documentary screenplay exploring concepts of the relations between a person and a place (Davis, 2013), the use of fictional screenwriting in referencing and complementing real events (Beattie), screenwriting exploration of themes associated with white inheritance (Hassal, 2013) and more. All these screenwriting challenges differ from plain screenwriting by their commitment to explore the creative process (decisions, techniques, the writer's learning throughout the process etc.) which is related to a subject. It is a deliberate and reflective endeavor initiated with an intention and commitment to produce both a work of art and expand the knowledge of the creative process and/or the ability of screenwriting to represent and disseminate ideas from other domains.

The same paradigm is applied to the creative writing PhD's in screenwriting. Two examples for screenwriting doctorates are by McAuley (2017) and Mathews (2018). McAuley is a western screenwriter who loves Japan and intents in his creative research to write a screenplay that is "Japanese" and "transnational" at the same time. Throughout the writing he explored the way his own perceptions and experiences in Japan influenced his writing and how he found solutions to use his point of view to make the screenplay be considered as authentically "Japanese". McAuley's research is about the creative research of a screenwriter in a unique situation and facing a specific challenge.

Mathews' research is about the professional screenwriting concept of the "character are". He wrote a romantic comedy and throughout the writing process tried to understand better the concept, put to use and examination the way existing screenwriting theories gave guidance to the character arc. In the writing-research he realized that the way this concept is presented is not sufficient and offered definitions and practices to fill this gap.

Reviewing the two doctorates shows the diversity of questions that a creative writing PhD in screenwriting can cover in one case a unique

writing challenge related to the personal experience and situation of the writer, in the other an exploration into one of the craft's concepts.

The research method

The creative challenge of this research is to write a pilot screenplay for a science fiction TV series about the subject of human enhancement.

As Skains (2018) and Boyd (2009) describe in their methodological proposals, there should be an initial research question that the writer-researcher is interested in exploring which is related to the creative challenge. This question will be revisited and might be refined or rephrased throughout the work.

In this study the initial question was what is the creative process (creative decisions. considerations, challenges, conceptual framework) involved in writing a science fiction TV series about a morally, psychologically, philosophically and socially charged technological subject.

This question is dealing with a unique writing challenge, yet in itself it is relatively broad and comprehensive (though not dealing with the entire writing process but defining an area of exploration within it: the "translation" of a technological and philosophical subject

matter into a TV series). It can be divided into several sub-questions, some of which were evident at the get-go and some unveiled throughout the writing process: