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THE UNCANNY VALLEY IN CONTEMPORARY MUSIC

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THE UNCANNY VALLEY IN CONTEMPORARY MUSIC

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by
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ABSTRACT

THE UNCANNY VALLEY IN CONTEMPORARY MUSIC

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The *uncanny valley* theory explores the particular disturbance felt towards an entity in relation to the degree of human-likeness that is portrayed through that entity's anthropomorphic traits. Although the concept initially emerged from the field of robotics, its far-reaching influence on aesthetics became notably manifest in art. On the other hand, this aesthetic understanding also had roots in an earlier, seminal concept referred to as the *uncanny* (*das Unheimliche*). Within this context, this thesis will first of all outline the critical relationship between the uncanny and uncanny valley concepts under the overarching topic of uncanny aesthetics.

The primary objective of this thesis will be to identify the various occurrences of the uncanny valley effect in contemporary music. For this purpose, the causal factors of the phenomenon has been divided into seven categories, being Bodily Appearance, Bodily Motion (Gesture, Facial Expression, Corporeality), Speech, Voice, Persona, Crossmodal Mismatch, and Fiction. Each category and subcategory will be matched with a pertinent example from contemporary music, followed by a discussion on the emotional and contextual significances of the specified categories within those works. Ultimately, this thesis intends to draw a historical correlation between uncanny aesthetics and the various artistic approaches that can be observed in the referenced contemporary music works.

Keywords: Contemporary Music, Masahiro Mori, The Uncanny, Uncanny Valley

ÖZET

ÇAĞDAŞ MÜZİKTE TEKİNSİZ VADI

Çekem, Artun

Yüksek Lisans, Müzik

Tez Danışmanı: Dr. Öğr. Üyesi Onur Türkmen

Haziran 2020

Tekinsiz vadi teorisi, bir öznenin sahip olduğu antropomorfik niteliklerin gerçek insana benzerliği ile orantılı olarak o özeneye karşı duyulan rahatsızlık hissini irdeler. Her ne kadar bu kavram asıl olarak robotik alanında ortaya çıkmış olsa da, barındırdığı estetik tartışmaların etkisi sanatta da çeşitli yansımalar göstermiştir. Söz konusu estetik tartışmaların özü tarihsel olarak daha eski olan *tekinsizlik* (*das Unheimliche*) kavramına dayanmaktadır. Bu bağlam içerisinde, bu tez öncelikli olarak tekinsizlik ve tekinsiz vadi kavramları arasındaki köklü ilişkiyi ortaya koyarak tekinsizliğin estetiği konusunu inceleyecektir.

Bu tezin birincil amacı çağdaş müzikte tekinsiz vadi kavramının izlerini saptamaktır. Bu amaç kapsamında tekinsiz vadi olgusunun nedensel unsurları yedi kategoriye ayrılmıştır: Bedensel Görünüm, Bedensel Hareket (Jest, Surat İfadesi, Bedenin Maddeselliği), Konuşma, Ses, Karakter, Duyular Arası Uyumsuzluk, ve Kurgu. Her kategori ve alt kategori çağdaş müzikten uygun birer eserle eşleştirilecek ve ilgili unsurların bu eserlerdeki duygusal ve bağlamsal işlevleri irdelenecektir. Nihai olarak bu tez, irdelenen çağdaş müzik eserlerindeki muhtelif sanatsal yaklaşımlar ile tekinsizliğin estetiği arasındaki tarihsel bağı vurgulamayı hedeflemektedir.

Keywords: Çağdaş Müzik, Masahiro Mori, Tekinsiz Vadi, Tekinsizlik

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INTRODUCTION

“Anthropomorphism, the interpretation of nonhuman things or events in terms of human characteristics, as when one senses malice in a computer or hears human voices in the wind” (Guthrie, 2008). Stewart E. Guthrie provides the above definition for “anthropomorphism”, a historically recurring tendency within all cultures to view non-human objects or entities in our own human image. There have been various theories on why we anthropomorphize things, one general explanation being that it “(...) results from the uncertainty of perception and from the practical need to discern humans, human messages, and human traces in a chronically ambiguous world” (Guthrie, 2008). However, even when we understand the reason behind why we carry such an innate tendency, there still remains one critical question: returning to the initial definition given by Stewart E. Guthrie, one could also wish to ask “Why is it that when we are speaking of anthropomorphic entities, we often think of malignant, threatening, and overall unpleasant beings?” “Why is the very first example provided by Guthrie, that is the example of sensing malice in a computer, a deliberately adverse one?” Perhaps the question could ultimately be simplified as follows: “How and why do anthropomorphic entities disturb us?”

For the last few decades, there has been growing a new body of literature that aims to answer these questions in relation to a theory named as the *uncanny valley*. This theory was first put forward by roboticist Masahiro Mori in his 1970 essay “The

Uncanny Valley”, in which he pointed out a peculiar disturbance that anthropomorphic entities¹ can elicit through their human-like traits. According to Mori, the closer an object resembles a human person, the more likable it becomes; until there arrives a crucial point where the object is perceived as *almost* human but *not quite*. At this point, our positive affinity suddenly tends to drop down to a remarkably negative level and this unsettling zone between the human and non-human is named “the uncanny valley”.

The uncanny valley became a highly popular subject within the fields of cognitive science and android research; however, in addition to its popularity among scientific studies, the concept also made a considerable impact on art and mainstream culture in general. Artists and creators widely embraced and appropriated the captivatingly eerie quality of the phenomenon and went on to utilize the unsettling facets of anthropomorphism in their works. The products of these endeavors accordingly pointed towards an aesthetic that deals with elements such as liminality, human-likeness, and grotesque imagery. However, it is also imperative to note that this aesthetic approach did not actually originate with the uncanny valley theory. Virtually all of the defining aspects mentioned above in regard to the uncanny valley in fact already had roots in a former concept named as the *uncanny* (*das Unheimliche*), notably explored by Ernst Jentsch and later on, Sigmund Freud. The uncanny concept was first formulated during the early 20th century within the field of psychology and set the foundation to many of the essential elements that are also associated with the uncanny valley theory. In this regard, the uncanny valley can be considered as a

¹ The essay particularly focuses on human-like robots, but Mori also refers to other examples such as “zombies” and Japanese *Noh* masks (Mori, 1970/2012).

successor or even a sub-branch of the uncanny concept, as they both pertain to a common aesthetic understanding.

Masahiro Mori's uncanny valley theory and the relevant strands of research that study the phenomenon primarily deal with the visual domain. The effect is commonly measured according to one's emotional responses towards an entity's anthropomorphic appearance or motion. Therefore, when speaking of the uncanny valley's place within art, one may mostly refer to visual examples such as sculptures, paintings, or cinema, and accordingly overlook its influence on music. Although there have been various studies that trace the Jentschian and Freudian uncanny within 19th to early 20th century works (Gibbs, 1995; Cohn, 2004; Péteri, 2007; Hentschel, 2019), the uncanny valley's presence in music appears to be relatively untouched as a subject. Following this premise, the primary objective of this thesis will be to identify the traces of the uncanny valley phenomenon in music that is written after 1970, which is the year when Mori wrote his influential essay. Chapter I will delineate the historical emergence of the uncanny concept, compare the Jentschian and Freudian perspectives on the matter, and discuss the uncanny elements within Western art from 19th to early 20th century in order to highlight the concept's essential motifs. Chapter II will then outline the relationship between the uncanny and the uncanny valley and delve deeper into Masahiro Mori's theory. Finally, Chapter III will explore the occurrence and significance of the uncanny valley effect in contemporary music by categorizing the causal factors of the phenomenon and matching each category with a pertinent musical example. The study will ultimately attempt to demonstrate how various artistic approaches taken by the composers of the referenced works either deliberately or unintentionally point to a customary aesthetic pertaining to the uncanny and uncanny valley concepts.

CHAPTER I

THE UNCANNY (*DAS UNHEIMLICHE*)

1.1. Modernity and the Emergence of the Uncanny

In his 1917 lecture “Science as a Vocation”, Max Weber uses the word “disenchanted” to define the Western cultural lineage which he saw to be driven by rationalization and intellectualization (Weber, 1919/2004:13):

Unlike the savage for whom such forces existed, we need no longer have recourse to magic in order to control the spirits or pray to them. Instead, technology and calculation achieve our ends. This is the primary meaning of the process of intellectualization.

The “disenchanted” age alluded by Weber was perhaps most clearly shaped during the modern era. With the advent of the Scientific Revolution starting from the 16th century, there grew to be an increasing conviction in the scientific method and empiric endeavors for understanding the natural world (Andersen & Hepburn, 2015). The works of key figures such as Copernicus, Galileo, and Newton paved way to new cultural paradigms that challenged the preconceived notions originated by religious and supernatural faith. Any epistemic claim that did not withstand experimental testing, including those put forward by the Church, now faced the risk of being put aside as groundless suppositions. Followed by the Enlightenment movement’s

influence, the individual's own ability for reasoning started to be given precedence over spiritual thought. "'Have courage to use your own understanding!'"—that is the motto of enlightenment." (Kant, 1784/1992:1) said Kant, in a time when theologians were no longer considered to have the decisive answers on matters of law, morality and natural sciences (Pagden, 2013). The modern intellectual thus strived to achieve knowledge that was "lasting and unshakable in the sciences" (Descartes, 1641/2008:13) and a chasm began to grow between what was accepted to be rational and superstitious.

In spite of the cultural shift that was happening in Europe, the question still remained if the "magic and spirits" were ever truly banished from the Western society. On one hand, the enlightened minds would reject the existence of such irrational phenomenon; yet, on the other, there appeared to be a new fascination among the population towards mystical and metaphysical affairs. As the literal belief in ghosts went on to disappear from intellectual discourse, this time upon public demand, "spectacle" ghosts came into being within fiction, theatre, and entertainment (Clery, 1995). In this regard, it is not coincidental that Gothic literature first started to appear in the 18th century, in part as a reaction to the overly "probable" rationality of modern fiction (Clery, 2002). In her book "The Rise of Supernatural Fiction", E.J. Clery posits the following explanation for the public's attraction towards the supernatural (Clery, 1995:5):

The unreality of these tales now goes without question; 'poetic faith', the voluntary suspension of disbelief, replaces 'rural faith'. The dangers of credulity have been overtaken by the primary goal of provoking sensation.

This way, the fear of the supernatural itself became an entertainment commodity. The individual got to experience the enchanted world of the past from the safe distance of their disenchanted modernity. One could tell, while reading a novel, that the fictitious elements in the story were purely products of the author's imagination; but nonetheless, the thrilling *sentiment* still remained. The authors themselves tended to write with this awareness, as often times the supernatural incidents would be presented behind a veil of mystery, and certain characters in the story would also share the reader's incredulity while facing these irrational circumstances. Plausible or not, the authors did not shy away from adorning their stories with most improbable anomalies with the intention of creating affect (Clery, 1995). The resulting sensation was rooted in ambivalence; it was derived from the conflict between a person's rationale and feelings. The widespread effect of such fiction was reflective of the fact that even though the superstitions of the past could be eradicated from faith, they were still preserved on a deeper sentimental level. Ultimately, this particular sentiment that was evoked through intellectual uncertainty later got to be named as the *uncanny*.

For the uncanny to exist, there first has to be doubt; an unexpected disruption that momentarily shakes our conviction in our rationalized world. This disruption consequently transforms what we initially accepted to be commonplace into something strangely familiar, hence alien and disturbing. It is for this reason that the uncanny is often claimed to be a modern invention. As John Jervis writes in "Uncanny Modernity: Cultural Theories, Modern Anxieties" (Jervis, 2008:28):

(...) the world has to be fundamentally *ordinary* before being invested with an uncanny aura; or, the uncanny works *through* the ordinariness of the world, even produced *by* it, as though a de-sacralised, disenchanted world becomes uncanny in its very essence.

This statement establishes a necessary distinction between what is frightening and what is uncanny. We call a situation frightening when the underlying threat is evident to us, while the uncanny only contains the subtle hint of a threat, it is a predicament that we are forced to solve through our own subjective judgment. Therefore, the uncanny inevitably touches upon our internal balance; our mental framework, long-held beliefs, and repressed anxieties. In accordance with this psychical quality of the uncanny, it is not surprising that the topic was first popularized within the field of psychology, in early 20th century Europe.

1.2. The Uncanny Through the Scope of Ernst Jentsch and Sigmund Freud

The coining of the uncanny as a concept is often attributed to Sigmund Freud, particularly in relation to his 1919 essay “The Uncanny” (“*Das Unheimliche*”) (Royle, 2003); however, Freud himself postulated a considerable amount of his ideas as an indirect response to an earlier essay written by Ernst Jentsch. While Freud stated that there were virtually no studies to be found on the subject of the uncanny, he still acknowledged Jentsch’s text as an exception (Freud, 1919/2003). Freud disagreed with Jentsch on the most fundamental premises regarding the source of the uncanny, which will further be discussed in this chapter. Even though the contemporary understanding and assessment of the concept is largely based on the Freudian perspective (Masschelein, 2011), several of Jentsch’s propositions on the matter still prove to be highly congruent with the subsequent studies made on both the uncanny and the uncanny valley².

The uncanny as a psychological phenomenon was notably explored by the psychiatrist Ernst Jentsch in his 1906 essay “On the Psychology of the Uncanny”. Jentsch begins

² The relevancy of Jentsch’s essay with the uncanny valley theory will be discussed in Chapter 2.1.

his essay by describing the experience of the uncanny as a “lack of orientation”, but further adds that his interest lies more in identifying the causal factors of the uncanny rather than defining what the uncanny really is (Jentsch, 1906/2008). Since Jentsch avoids providing a clear definition of the concept, it is difficult to surmise how he precisely distinguishes between the uncanny and other forms of uneasiness or fear; however, he nonetheless seems to regard the uncanny as a distinct matter of the affects. According to Jentsch, the primary cause of uncanniness is “psychical uncertainty”. He argues that the more a person has “intellectual mastery” over a certain situation, the more “at home” or “homely” (*heimlich*) that person feels. Similarly, if a person lacks the understanding to be well acquainted with a particular situation, then they will be more likely to experience uncertainty and therefore find themselves in an uncanny (*unheimlich*) position. In this regard, it is a person’s knowledge and rationale which protects them from fearful doubt. He infers that this is the reason why children are so easily frightened, as they lack the necessary experience to become familiar with even the most mundane circumstances.

Alongside his claim that uncanniness is an affect that is primarily rooted in intellectual uncertainty, Jentsch’s arguably most crucial contribution to the subject was the examples which he chose to provide in relation to the causal factors of the uncanny (Jentsch, 1906/2008:8):

Among all the psychical uncertainties that can become a cause for the uncanny feeling to arise, there is one in particular that is able to develop a fairly regular, powerful and very general effect: namely, doubt as to whether an apparently living being really is animate and, conversely, doubt as to whether a lifeless object may not in fact be animate – and more precisely, when this doubt only

makes itself felt obscurely in one's consciousness. The mood lasts until these doubts are resolved and then usually makes way for another kind of feeling.

Jentsch gives wax sculptures as an example for the statement above, suggesting that such figures in certain occasions can be difficult to distinguish from actual humans and therefore become disturbing to the viewer. Because the individual feels momentarily confused regarding the authentic nature of the wax figure, they are left with an "unpleasant impression" as a result. More importantly, Jentsch asserts that the unsettling sentiment can still remain even after the point where the person is convinced that they are in fact observing an inanimate object rather than a real human being. In other words, the individual's knowledge and rationality is not enough in these cases to alleviate the perturbation caused by the wax figure. Some other arbitrary examples that Jentsch gives in addition to wax sculptures are scarecrows, manmade models of mythological creatures, polychrome sculptures, a tree trunk that may resemble the organic body of a giant snake, boiling water that may give the impression of an animal moving inside, life-size automatons portraying human behavior, a shadow resembling a Satanic face, irregular body spasms caused by epileptic seizures, and several more (Jentsch, 1906/2008).

According to Jentsch, certain types of sounds also have the potential to elicit an uncanny sentiment (Jentsch, 1906/2008:8-9):

Conversely, the same emotion occurs when, as has been described, a wild man has his first sight of a locomotive or a steamboat, for example, perhaps at night. The feeling of trepidation will here be very great, for as a consequence of the enigmatic autonomous movement and the regular noises of the machine, reminding him of human breath, the giant apparatus can easily impress the

completely ignorant person as a living mass. There is something quite related to this, by the way, when striking or remarkable noises are ascribed by fearful or childish souls – as can be observed quite often – to the vocal performance of a mysterious being.

This remark is particularly fitting with the aim of this thesis, as such sounds allow the possibility for the uncanny effect to be carried into music. In fact, sounds hold a special place within the uncanny literature due to their impalpable quality. Since sounds can exist in non-diegetic or acousmatic contexts, they can commonly be utilized to represent supernatural entities within fiction. As Isabella van Elferen also writes in her book “Gothic Music: The Sounds of the Uncanny”: “Sound suggests presence even when this presence is invisible or intangible, and is thus closely related to the ghostly” (Elferen, 2012:4). Whenever we hear a sound, we are immediately inclined to trace it back to its original source in order to grasp its nature and its implications. Thus, a sound with an enigmatic presence can cause a discrepancy within our perception and consequently signal threat³.

Despite how pivotal Jentsch’s essay was for the subject of the uncanny, his ideas inevitably became outmoded due to the latter evolution of the concept⁴. The problem of defining the uncanny was mostly untouched by Jentsch, which left a considerable gap in his interpretation. This gap would later be fulfilled by another colleague of his, Sigmund Freud, in his 1919 essay “The Uncanny”. With this essay Freud not only

³ The use of sound to create uncanny settings will be discussed in more detail in the following chapters.

⁴ The same can also be claimed for Freud’s conceptualization. Even though his essay still serves to be the main point of reference for contemporary theorists, it also remains relatively limited with its questionable psychoanalytic approach. As the uncanny became an increasingly popular subject during the late 20th century, its definition and applications greatly expanded out of the psychoanalytic discourse (Masschelein, 2011).

brought a new perspective to the concept but also challenged Jentsch's most central propositions on the matter. Unlike Jentsch, Freud was closely interested in finding a definition for the uncanny, so he allocated the entire first section of his essay to this aim. At the start of his essay Freud provides a compilation of dictionary translations for the word "uncanny" in several different languages and argues that the German translation of the word, *unheimlich*, offers a particularly interesting insight. According to Freud, the word *unheimlich* (uncanny, unhomely) accurately reflects the essence of the uncanny, especially when it is examined in conjunction with its antonym *heimlich* (homely, familiar). In order to demonstrate the relationship between these two words, Freud cites a concise list of examples taken from Daniel Sanders' "Dictionary of the German Language"⁵ where the word *heimlich* is used within sentences belonging to a variety of contexts. Through these examples it is revealed that the word *heimlich* can actually convey two distinct ideas: on one hand, *heimlich* can be used to describe something which relates to homeliness and is therefore familiar and congenial; yet on the other, it can also represent something that is hidden, concealed or kept out of sight, because it again belongs to the privacy of an enclosed home. Freud asserts that the latter use of the word expands the definition to the point that *heimlich* actually becomes interchangeable with its antonym *unheimlich*. To prove this relationship, he refers to a striking example taken from Sanders' dictionary, a passage from a novel by Karl Ferdinand Gutzkow (Freud, 1919/2003:129):

"The Zecks are all mysterious." "Mysterious? ... What do you mean by 'mysterious'?" "Well, I have the same impression with them as I have with a buried spring or a dried-up pond. You can't walk over them without constantly feeling that water might reappear." "We call that uncanny ['unhomely']; you

⁵ "*Wörterbuch der Deutschen Sprache*"

call it mysterious [‘homely’]. So, what makes you think there’s something hidden and unreliable about the family?’”⁶

Since something that is *heimlich* or homely can at the same time refer to something that is hidden behind a veil, its ambivalent nature can potentially be perceived as unsettling by an individual, thus becoming inherently uncanny. For this reason, Freud claims that the danger of an uncanny situation is fundamentally shaped by its homely or familiar character. The uncanny therefore takes on a new definition, evolving from being something that is outright “unfamiliar” to something that is “strangely familiar”. In Freud’s own words: “(...) the uncanny is that species of the frightening that goes back to what was once well known and had long been familiar” (Freud, 1919/2003:124).

What Freud meant by “once well known and had long been familiar” is further elaborated on the remaining chapters of his essay. Within the context of familiarity, Freud divides the uncanny into two species: one that pertains to our “psychical reality” and the other pertaining to our “material reality”. According to Freud, the uncanny that relates to our psychical reality resides in our repressed anxieties and early childhood experiences. He argues that during our development, certain sources of anxiety such as the fear of castration⁷ or threats to our ego⁸ get buried in our

⁶ ‘Die Zecks sind alle heimlich’. ‘Heimlich?... Was verstehen Sie unter heimlich?’ ... ‘Nun... es kommt mir mit ihnen vor, wie mit einem zugrabenen Brunnen oder einem ausgetrockneten Teich. Man kann nicht darüber gehen, ohne dass es Einem immer ist, als könnte da wider einmal Wasser zum Vorschein kommen.’ ‘Wir nennen das unheimlich; Sie nennen’s heimlich. Worin finden Sie denn, dass diese Familie etwas Verstecktes und Unzuverlässiges hat?’

⁷ The castration anxiety is a recurring topic within Freud’s psychoanalytic theory. Freud claims that boys in their early childhood stages develop a fear of being castrated by their parental figures as a penalty for acting upon their sexual desires. This repressed anxiety can later manifest itself in adulthood, either directly through the fear of losing their genitals, or indirectly through the fear of losing limbs, eyes, or other precious body parts (Freud, 1924/1961; Freud, 1919/2003).

unconscious minds through repression. Later on, when a familiar situation occurs that reminds us of our initial childhood experiences, we perceive that situation to be uncanny even though we might not be able to tell why. One example that Freud provides on this matter is the uncanny feeling elicited by severed limbs or heads, especially when they are shown in an independently animate state within fictitious works⁹. Freud sees this effect to be in close proximity with his theory of castration complex.

While our psychical reality is defined by our individual experiences, our material reality more so relates to our collective understanding of the world. With that, Freud refers to our cultural accumulation of scientific knowledge that dictates how we differentiate plausible truths from superstitious beliefs. Freud asserts that whenever we face an unusual situation that challenges our logical reasoning, we come back to a childlike state where our long surmounted irrational fears return to us as possible realities. In this regard, Freud draws a comparison between our personal growth to adulthood and the growth of the human civilization throughout history: “It appears that we have all, in the course of our individual development, been through a phase corresponding to the animistic phase in the development of primitive peoples” (Freud, 1919/2003:147). Therefore, humankind’s supposedly surmounted animistic beliefs are equated to our repressed childhood anxieties; the moment they return from where they

⁸ Freud mentions the *doppelgänger* as a threat to our ego, a concept that was thoroughly explored by Otto Rank in his 1925 book “The Double”. The motif of the double is widely used in storytelling as an “uncanny harbinger of death” (Freud, 1919/2003:142). In such stories, the double is often depicted as a direct counterpart or replica of a person who in return haunts and threatens to replace the original character. If the character ever manages to destroy their double, it inevitably results in their own death, as they actually end up destroying a part of their own selves (Rank, 1914/1971). Ultimately, the double serves as a product of our narcissistic fear of self extinction (Freud, 1919/2003).

⁹ Freud cites the novel “Josef Montfort” by Albrecht Schaeffer, in which there is a part where detached feet that dance by themselves.

are buried, the uncanny emerges. As an example, Freud mentions superstitious fears that are tied to “omnipotent thoughts”. He recounts an instance when a patient of his openly wished death upon an elderly man and two weeks later, the elderly man suffered a stroke. His patient found this situation uncanny, as his wish seemed to be granted through supernatural means.

Freud and Jentsch’s essays on the uncanny coincide in one crucial aspect, which is the assessment of the uncanny through literary works. The famous Gothic horror writer E.T.A. Hoffmann gets a notable mention on this matter, as he is attributed to be a master of the uncanny by both Ernst Jentsch and Sigmund Freud. Although Hoffmann is only briefly mentioned by Jentsch, his reference inspires Freud to delve deeper into the author’s work in order to formulate his own arguments on the uncanny. The difference of opinion between Jentsch and Freud mainly lies in where they find the uncanny factor to be in Hoffmann’s work. While Jentsch’s theory is centered on intellectual uncertainty and anthropomorphism¹⁰, Freud claims that intellectual uncertainty remains as an insignificant factor compared to other motifs that relate to his theory on psychical and material realities.

Freud takes Hoffmann’s short story “Der Sandmann” (“The Sand-Man”) as the focal point of his essay. The story encompasses a range of uncanny elements that concern both sides of the argument, such as the protagonist’s ongoing intellectual uncertainty, his affair with a humanlike wooden automaton, repressed childhood traumas, the fear of losing one’s eyes¹¹, an evil man with doubles¹² (*doppelgänger*), and more. In short,

¹⁰ Examples such as wax figures, automatons, scarecrows, and shadows all seem to share this peculiar feature.

¹¹ Freud relates this motif to castration anxiety.

the story is about a man named Nathanael, who as a child was told frightening tales about a mysterious figure named the Sand-man. The Sand-man was said to come for children in the night and steal their eyes in a gruesome manner to feed them to his offspring. Although Nathanael refuses to believe in this tale in the literal sense, his repressed fear of the Sand-man still haunts him throughout his life. Both as a child and as an adult, Nathanael experiences some traumatic incidents with which his irrational fear of the Sand-man is validated. As a boy, an acquaintance of his father named Coppelius, whom Nathanael associates with the Sand-man, catches Nathanael spying on them one night and attempts to burn his eyes out. Years after this event, Nathanael moves away to study at a university and this time comes across a weather-glass salesman named Coppola. Nathanael sees a strong resemblance between Coppola and Coppelius, so once again his fears temporarily return to him; especially during an instance when Coppola claims to be selling “eyes” when he actually means spyglasses and spectacles. Meanwhile, Nathanael falls deeply in love with the daughter of his professor, an oddly silent woman named Olimpia. One day, Nathanael decides to visit Olimpia to confess his feelings to her; but upon his visit hears a strange fight coming from the professor’s study chamber. Nathanael enters the room and witnesses Coppola and the professor fighting over Olimpia’s lifeless body, who is then revealed to be an automaton. Seeing that Olimpia has now two empty eye sockets with her detached eyes lying on the floor, Nathanael becomes engulfed by madness and tries to strangle the professor while Coppola makes an escape. Some time passes and Nathanael seems to recover yet again; however, we soon realize that his madness has never really left him. During a peaceful excursion with his fiancée,

¹² It should be noted that in this case, the double does not replicate the protagonist but conversely the antagonist. Nevertheless, it is used as an uncanny element in the story, as the semblance of the doubles instills doubt into the protagonist Nathanael.

Nathanael makes the mistake of staring through his pocket spyglass which he had gotten from Coppola, and as soon as he sees his fiancée in front of the glass, he falls into delirium. In his delirious state, Nathanael tries to strangle his fiancée and eventually jumps down to his own death.

The uncertainty that surrounds Nathanael's inner conflict regarding his superstitious fears, as well as the initial ambiguity behind the wooden doll Olympia whom Nathanael mistakes for a human, all serve as uncanny motifs that are congruent with Jentsch's theories. On the other hand, Freud points out that even after all the uncertainties in the story are resolved and Nathanael's fear of the Sand-man is justified, the uncanny factor still remains. For this reason, Freud suggests that the uncanniness of the story does not originate from intellectual uncertainty or the wooden doll Olympia, but rather from the figure of the Sand-man himself. In this sense, the story satisfies both of Freud's psychical and material conditions for the uncanny. Nathanael's psychical reality is disturbed because of his repressed childhood fear of the Sand-man, and his material reality is distorted because his experiences do not fit into his rational framework. With the latter condition, Freud actually comes remarkably close to Jentsch's theory on intellectual uncertainty. Even though Freud claims that intellectual uncertainty does not effectively contribute to the uncanniness of the story, his purported correlation between the uncanny and superstitious doubt seems to be touching upon the same effect. A similar contradiction, however, can also be spotted in Jentsch's theorization. On the matter of the uncanny effect that is elicited by wax figures, Jentsch states that the unpleasant sentiment can still remain even after when the person has consciously solved their intellectual predicament. This statement fits Jentsch's view that the uncanny stems from a semi-conscious and obscure form of doubt, but it also contradicts his initial premise regarding the uncanny

being a product of one's conspicuous ignorance. Jentsch considers the lingering fear that stays after an uncanny encounter simply to be a residue of the initial experience, while for Freud, this "residue" is the uncanny itself. Ultimately, they both agree that the uncanny feeds from psychical uncertainty; but for Freud, this obscure uncertainty predominantly exists in the unconscious domain rather than being dependant on one's lack of intellectual mastery.

Jentsch and Freud's differing opinions on uncertainty and ignorance can also aid us in comparing their references to the "primitive man" and "animistic beliefs". Jentsch refers to the "primitive man" in order to explain the fear that is caused by something "unfamiliar". According to Jentsch, the "primitive man" falls into fear because he lacks the intellectual mastery to better analyze his situation. On the other hand, Freud makes the same reference because he sees a connection between our surmounted irrational fears and our overall cultural history. Therefore, Freud's uncanny rather relates to that which is "strangely familiar", because his necessary condition for an uncanny experience is to possess a level of intellectual mastery -and thus a familiarity- in the first place. One first has to have a "rational" understanding of the world that is dictated by modern science and ideals, so that the rational framework can then be subjected to defamiliarization by the uncanny occurrence (Collins & Jervis, 2008).

Upon comparing the two essays written by Ernst Jentsch and Sigmund Freud, it becomes clear how Freud's perspective on the matter has influenced the common view that the uncanny is essentially a modern phenomenon (Royle, 2003). The concept's conflict with modern rationality only finds meaning once we understand its "strangely familiar" quality. On the other hand, we shall also see in Chapter 2.1 that Jentsch's theories on the uncanny still prove to be highly relevant with more

contemporary concepts such as the *uncanny valley*. It is a topic of discussion whether a concept that is primarily assessed by its relation to modern paradigms can still apply to our current world; however, the following chapters shall nevertheless demonstrate that both Jentschian and Freudian motifs are still resonant with contemporary theories. The concept itself has been explored by many 20th century writer and thinkers such as Jacques Derrida, Hélène Cixous, and Nicholas Royle (Brown, 2008) and the scope of the uncanny considerably expanded beyond Freud's psychoanalytic approach¹³. For this reason, it becomes imperative to further delve into the concept in order to realize its significance for the main subject of this thesis, the uncanny valley theory.

1.3. The Uncanny in Western Art from 19th to Early 20th Century

As discussed in the previous chapters, the concept of the uncanny has been attributed with countless traits, some which may even stand incompatible with each other. The uncanny may be conjured by intellectual uncertainty, long surmounted superstitious beliefs, or possibly be rooted in repressed childhood anxieties¹⁴. It may be aroused by the sight of a human-like wax figure, the sound of a screeching locomotive, perhaps even by a chain of unlikely coincidences. Regardless of how varied such theories may be, certain aspects of the uncanny nevertheless seem to be common in all examples. The threat of the uncanny is always hinted at indirectly; it exists in an in-between state that is constituted by ambivalence. Therefore, the uncanny is widely regarded as a particular feeling of strangeness that is born from the meeting point of the familiar and the unfamiliar (Royle, 2003). With this special quality in mind, Chapter 1.3 will delve deeper into the concept by identifying the uncanny in Western art from 19th to

¹³ Because this thesis mostly aims to focus on the uncanny valley theory, the late 20th century conceptualization of the uncanny is left out of this study.

¹⁴ See Chapter 1.2.

early 20th century¹⁵. Furthermore, this chapter will particularly aim to highlight the concept's relationship with anthropomorphism, human-likeness, and corporeality in order to set a foundation for Chapter 2, in which the *uncanny valley* phenomenon will be discussed.

The proposition that the uncanny is a product of the Enlightenment fundamentally stems from the concept's conflict with modern rationality. Once the supernatural was excluded from intellectual discourse, it found itself a new home within irrational doubt and uncanny ambivalence. Consequently, this modern incompatibility became reflected and exploited by the artist and authors of the relevant era. One particular literary style warrants special attention in this regard, that is the genre of Gothic fiction¹⁶. Having emerged within the same historical periods, the Gothic and the uncanny effectively complement each other; they both deal with liminal realities that engender hidden threats. In "The Cambridge Companion to Gothic Fiction", Jerrold E. Hogle writes: "Gothic fictions generally play with and oscillate between the earthly laws of conventional reality and the possibilities of the supernatural" (Hogle, 2002:2). Based on this statement, one could essentially argue that the primary characteristic of Gothic fiction is its inherent uncanniness in the first place. Rather than bringing the readers face-to-face with metaphysical impossibilities, Gothic writers choose to conceal such horrors within daily life and society. Gothic creatures are not simply

¹⁵ Although this chapter primarily focuses on works that were created during the 19th to early 20th century, it should be noted that the uncanny continued as an aesthetic in arts all throughout the 20th century. Many artist and writers such as Paul Celan (Kligerman, 2007), Man Ray (*The Uncanny*, n.d.), René Magritte (Freer, 2012), Hans Bellmer (Brown, 2008), and Mike Kelley (Masschelein, 2011) have been associated with uncanny art.

¹⁶ Gothic fiction is a European Romantic literary genre characterized by medieval themes, horror, mystery, and the supernatural. The style became most popular during the late 18th century and since then maintained its relevance through frequent revivals (Britannica, 2015).

monsters that lurk in caves; they are our own mirror images, our human acquaintances and loved ones who come back from the dead in the form of specters, vampires, or other “unholy” entities. The human-like aspects of their appearance, voice, or persona grant them an elusive façade; but perhaps even more importantly, they put into question what really makes us human to begin with. Gothic literature therefore provides a rich source for both the uncanny and the subject of anthropomorphism¹⁷.

1.3.1. Mary Shelley’s “Frankenstein; or, The Modern Prometheus” (1818)

The Gothic’s relationship with modernity and the uncanny is remarkably visible in the iconic novel “Frankenstein; or, The Modern Prometheus” by Mary Wollstonecraft Shelley. The story is not only known for its modern approach towards the age-old problem of life’s creation¹⁸, but it is also famously regarded as the first novel written in the science fiction genre (Aldiss, 1995). The novel mostly revolves around Victor Frankenstein, a young scientist who becomes disinterested in the limited affairs of modern science and instead wants to tackle grander issues such as “the philosopher’s stone and the elixir of life” (Shelley, 1818/1869:32). Through his studies, Frankenstein manages to invent a secret method with which he can animate lifeless matter and consequently gives life to an anthropomorphic creation of his own. For Frankenstein, the project ends up being an utmost failure and the monster haunts him until the end of his life.

The trope of the animated human-like being has long been present in fiction and mythology, as can be seen in examples such as Galatea, Talos, or the Golem;

¹⁷ For this reason, all the following examples in this chapter – with the exception of Henry Cowell’s “The Banshee” – were selected among Gothic fictions.

¹⁸ The novel’s title is a reference to the Greek myth on the creation of man. According to the story, the titan Prometheus builds the first man out of clay and shapes it in the Gods’ image.

however, what makes Frankenstein's monster special in this case is that for the first time in human history, such a being gets created not by magic or alchemy, but through modern science. In the story, young Frankenstein's passion for science is most strongly kindled by the writings of antiquated scholars such as Cornelius Agrippa, Albertus Magnus, and Paracelsus. His teachers and elders continually warn him about the false contents of such works: "I little expected, in this enlightened and scientific age, to find a disciple of Albertus Magnus and Paracelsus. My dear sir, you must begin your studies entirely anew." (Shelley, 1818/1869:36) says Victor's professor, who is a scholar of natural philosophy. Victor does eventually turn his methods towards modern science, but his lust for solving the impossible questions of the past still remains. In a way, the false promises of the ancient teachings entail a Freudian threat for the modern scientist; they are what Freud would describe as the repressed animistic beliefs of a bygone era. By dealing with such fanciful endeavors, Victor resurfaces a surmounted phase in human history and thence introduces the uncanny element into the story.

What makes Frankenstein's monster most uncanny is not that it was created as a monster, but that it was actually intended to be human. Victor works ardently on his project, crafting every material in minute detail to construct a human being. The monster's existence only becomes disturbing after its anthropomorphic frame comes to life: "His jaws opened, and he muttered some inarticulate sounds, while a grin wrinkled his cheeks. He might have spoken, but I did not hear; one hand was stretched out, seemingly to detain me, but I escaped and rushed downstairs." (Shelley, 1818/1869:45-46). The monster is neither aggressive nor threatening; on the contrary, it behaves like a newborn child who seeks affection and intimacy. It is precisely this quality of the monster that makes it more uncanny than scary; because he wishes to

fulfill his ascribed human nature and to be loved as such. Thus we come to understand that the monster's hideous appearance is only of secondary importance next to its true horror, that it now possesses a "soul". By attaining an animate state, moving, grinning, asking for intimacy, the monster inherently poses an existential problem regarding what being sapient really is. How Frankenstein describes the creature's physical appearance also complements this factor (Shelley, 1818/1869:45):

His limbs were in proportion, and I had selected his features as beautiful.

Beautiful! Great God! His yellow skin scarcely covered the work of muscles and arteries beneath; his hair was of a lustrous black, and flowing; his teeth of a pearly whiteness; but these luxuriances only formed a more horrid contrast with his watery eyes, that seemed almost of the same colour as the dun-white sockets in which they were set, his shrivelled complexion and straight black lips.

The more "beautiful" and "human-like" the creature is intended to be, the more uncanny it becomes. His bodily features have stayed exactly the same as they were before he was animated, yet his true wretchedness only becomes noticeable once he is infused with life: "I had gazed on him while unfinished; he was ugly then, but when those muscles and joints were rendered capable of motion, it became a thing such as even Dante could not have conceived." (Shelley, 1818/1869:46). The fact that this realization occurs so suddenly can also be taken as a condition of the uncanny. In his article "Wittgenstein and the Uncanny", Gordon C.F. Bearn writes (Bearn, 1993:37):

If the world comes to seem uncanny, this will not happen gradually, reasonable doubt by reasonable doubt; it will come all of a sudden. It will be prepared of course, like an avalanche, but when it comes, it comes all at once. The uncanniness comes as a revelation. What we had taken to be as secure as

possible is not subjected, piecemeal, to doubt. It is, all at once, shaken, solicited.

So we discover that Jentsch's *Unsicherheit*¹⁹ is also at the heart of Freud's purportedly contrasting analysis of the uncanny.

Here, the revelation in question is the transgression that Frankenstein committed by assuming the role of God. The monster therefore becomes a symbol of our own existential dilemma, its physical embodiment. As the reader, we are aware from the very beginning that Frankenstein's studies harbor an uncanny danger; however, albeit being expected, the repressed threat reveals itself so suddenly, seemingly out of nowhere. After that moment, we reach the point of no return and the events are set in motion in such a way that we already know there will be no salvation for Frankenstein.

The uncanniness of Frankenstein's monster is further amplified by the ambivalence of its persona. The contrast between its intended beauty and hideous appearance is directly paralleled by its character. Unlike the common movie cliché, the monster in the novel is actually an articulate, intelligent, and passionate being²⁰. He adroitly learns the English language merely by observing people and is delighted to read literary works such as "Paradise Lost, a volume of Plutarch's Lives and the Sorrows of Werter" (Shelley, 1818/1869:100). Having been exiled into living in harsh conditions outside the city, the creature becomes both a cultured man and a savage. On one hand, he suffers as the victim of a prejudiced society that rejects him despite his many redeeming qualities; yet, on the other, he acts as a murderous beast who is even capable of killing an innocent child. Always watching from the shadows, he

¹⁹ Uncertainty

²⁰ At one point in the story, he even manages to gain the affection of an old blind man with his skillful and genuine rhetoric, though this relationship lasts very short due to him being discovered and attacked by the blind man's family.

preys on Frankenstein's family like a wild animal and swiftly picks them out one after another without leaving any traces. The duality of the monster's persona once again puts the protagonist in an uncanny situation. Victor develops an undying contempt for the monster he has created, but at the same time he secretly acknowledges that there is an undeniable righteousness behind the creature's actions. In a way, he unconsciously represses his own guilt by further antagonizing the monster. Instead of admitting to his role in turning the monster into a villain, he chooses to view the monster as a deceitful, evil being. Towards the end of the story, Frankenstein makes the following warning to his acquaintance about the monster: "He is eloquent and persuasive, and once his words had even power over my heart; but trust him not. His soul is as hellish as his form, full of treachery and fiend-like malice." (Shelley, 1818/1869:165). Therefore we once again understand that the monster's most intimidating quality is not his brute strength or giant figure, but rather the uncertainty he provokes through his equivocal existence. Virtually every significant trait of the monster represents a dichotomy, an unsettling contradiction that opens up a portal to uncanny possibilities. Hence it is demonstrated through Mary Shelley's work that the uncanny neither only deals with the familiar nor the unfamiliar. It is her deliberate exploration of the borderline in between that makes "Frankenstein; or, The Modern Prometheus" a notable example for our subject.

1.3.2. Edgar Allan Poe's "The Man That Was Used Up" (1843)

In E.T.A. Hoffmann's "Sandman", the doll Olympia is purely a mechanical construct with no clear persona, and in Mary Shelley's "Frankenstein", the creature is built out of a combination of body parts and gets infused with a soul. Edgar Allan Poe's short story "The Man That Was Used Up", on the other hand, portrays yet another possible amalgam of human and non-human embodiment. The story is told by a narrator who

one day meets a revered war hero named Brevet Brigadier General John A.B.C. Smith. The narrator is immediately awestruck by the incredible figure of this man, describing every graceful feature of his body in great detail. However, despite the general's astonishing shape, the narrator still senses something to be slightly off with his mannerisms, which further kindles his interest in this mysterious man. By the end of the story it is shockingly revealed that the general's body almost entirely consists of artificial body parts and the disillusioned narrator comes to realize the toll that war took on the man's body.

The story is written in a conspicuously grotesque humor, to the extent that its lighthearted tone renders the events more satirical than uncanny. However, one could argue that this grotesqueness in itself embodies an uncanny quality, especially when it is assessed through the narrator's perspective rather than the reader's. Once again, the protagonist faces a situation where he is left alone in his disturbed feelings; however, this time it is not because everyone else in the story operates in a rational domain, but rather the opposite, everyone other than the narrator seems to have absurdly trivialized the general's condition²¹. General Smith's enigma is solved in such a farcical and offhand way that, as the readers, it becomes impossible for us to empathize with the protagonist's terror. Therefore, the grotesque functions like the uncanny, emerging from a liminal space where the comical and the ominous complement each other. In this regard, the story's uncannily grotesque conclusion strongly resonates with Hoffmann's "The Sandman", as in both stories the protagonists naively idealize artificial beauty and are ultimately disillusioned by it. The stories progress as if both characters are walking through a bad dream with

²¹ The reason behind this satirical twist calls for a more political reading concerning manhood, race, and the glorification of war (Beuka, 2002), which in this case are left out from the scope of this thesis.

nobody to hold on to and the point of their disillusionment also becomes their moment of utmost horror. Their idealized figures quite literally get dismantled right in front of them and consequently, their fascination turns into repulsion through a sudden defamiliarization.

General Smith's dismembered body evokes uncanniness in both Jentschian and Freudian ways. In his essay on the uncanny, Ernst Jentsch asserts that epileptic seizures can be disturbing to witness from the outside, because the uncontrollable muscle spasms "reveal the human body to the viewer" (Jentsch, 1906/2008:14). In other words, when the human body is observed as a mechanical structure independent from its identity, we are made to acknowledge its material nature and thus, the material nature of our own corporeality. This realization engenders an existential crisis that is also reflected in Edgar Allan Poe's story. The narrator regards the general's artificial body as the epitome of beauty by mistakenly confusing it with a "real" one. Therefore, he realizes in the end that not only the human body can be successfully replicated through material means, but that it can even be made better than the biological human form.

The Freudian perspective, on the other hand, would suggest that the defamiliarization effect caused by the dismembered body directly relates to "castration anxiety".

According to his theory, our unconscious mind would code the image as a threat to our bodily integrity, which is subsequently perceived as a threat to our own ego. This effect is also touched upon by Diana Almeida in her brief analysis of Poe's story:

"Science and medicine make the body a chartable map, and this reification amplifies man's sense of loss, turning death into the ultimate terror..." (Almeida, 2010:164).

This somewhat Freudian look posits a reciprocal relationship between the body and the self, as can also be found in the psychoanalytic concept of the double. Continuing

with Almeida's text, we can further see how the Freudian uncanny relates to the matter of body and identity (Almeida, 2010:163):

In a progressively secularized world where the spiritual (equated with the irrational) is excluded from the discursive realm, the body becomes the sole index of selfhood, although its mutability points both towards death as annihilation and to identity as performance (...) The body is thus seen as the tentative frame for anchoring the pretenses of identity, while simultaneously being perceived as a radical alterity, an assemblage of perishable flesh that has long ceased to sustain a soul.

In accordance with this statement, we can once again draw a historical parallel between the uncanny and the inclusion of corporeality and body horror in "The Sandman", "Frankenstein", and "The Man That Was Used Up". As the material distinction between our body and identities starts to become blurred, our underlying existential anxieties get externalized and thence projected into the physical forms of Gothic's uncanny figures.

1.3.3. Henry Cowell's "The Banshee" (1925)

Henry Cowell was one of the most innovative composer and performers of his time, whose unique approach to sound, musical instruments, and extended techniques effectively pushed the boundaries of classical music conventions. His works drew from a wide range of influences such as mysticism, religion, technology, environmental noise, and mythology (Weisgall, 1959; Cizmic, 2010). "The Banshee" for solo piano is one of such works; the piece includes references to both Irish mythology and Catholic liturgy, and at the same time radically repurposes the piano

as an instrument²². Its uncanny effect can be directly attributed to the particular sound world it evokes; but also to the way its performance profoundly estranges the listener and the performer.

In Celtic folklore, a banshee is a supernatural being whose mournful cries signal death for a family member of the person who hears it (Britannica, 2020). The premise of Cowell's "Banshee" is therefore already eerie to begin with; however, what makes the piece especially uncanny is how Cowell chooses to translate the banshee's wailing into the piano. The imagery in "The Banshee" is quite literal; although the composer does make use of symbolic pitch relationships and dissonant tone clusters²³, the music primarily gets its expressive power from its mimetic approach. By using extended techniques such as plucking, rubbing, strumming, and scraping on the piano strings (Cizmic, 2010), the performer aims to achieve vocalized sounds that resemble the howling of a hypothetical banshee. Therefore, by favoring acoustic imitation over a symbolic musical language, Cowell aims to evoke the physical presence of a supernatural being in the concert hall. In this regard, Cowell's "Banshee" brings to mind Jentsch's example of a locomotive producing loud breathing noises. In both cases, it is the human-like, vocalized quality of the sounds that truly make the listening experience uncanny. There is a subtle sense of uncertainty being elicited by the piece, as the listener can hear the banshee's voice but cannot detect its presence. Cowell's music therefore accurately reenacts the banshee's myth on the modern stage

²² The music is physically performed on the piano strings rather than the keys. Cowell claims that when the piano is performed in this fashion, it can be considered as a new instrument which he names the "stringpiano" (Cizmic, 2010).

²³ The melodic material is primarily based on the "Dies Irae" chant, which Cowell utilizes by altering the original melody's contour and intervallic properties (Cizmic, 2010).

by copying its main premise: the spirit, who afflicts its curse solely through its voice, can be heard but cannot be seen.

In his book “A Voice and Nothing More”, Mladen Dolar tells the story of Wolfgang von Kempelen, a real 18th century inventor who toured Europe with his “Speaking Machine” and a chess-playing automaton named “The Turk”. Even though “The Turk” was actually a hoax, the “Speaking Machine” was in fact able to produce convincing human-like sounds through its mechanical structure. Dolar shares a witness’s account from 1784, in which the witness describes the experience as “goose-flesh inducing horror” (Dolar, 2006). Mladen Dolar then makes the following comment on Kempelen’s “Speaking Machine” (Dolar, 2006:7-8):

The machine nevertheless kept producing effects which can only be described with the Freudian word “uncanny”. There is an uncanniness in the gap which enables a machine, by purely mechanical means, to produce something so uniquely human as voice and speech. It is as if the effect could emancipate itself from its mechanical origin, and start functioning as a surplus – indeed, as the ghost in the machine; as if there were an effect without a proper cause, an effect surpassing its explicable cause (...)

This disembodied voice effect is precisely what makes Cowell’s “The Banshee” uncanny. The music gives life to a voice without a proper cause. It is also crucial to note that “The Banshee” manages to produce this effect not with the help of a “speaking machine”, but rather through an overly familiar musical instrument with several centuries of history (Cizmic, 2010). To an early 20th century audience, such unconventional use of a well-known instrument could easily have been a

defamiliarizing experience²⁴. Furthermore, the effect is also enhanced by the fact that the pianist's hands operate inside the instrument's body during the performance²⁵, therefore hiding the actual source of the sound from the audience (Cizmic, 2010). In this regard, "The Banshee" embodies uncanniness in both aural and visual ways. Much like Kempelen's "Speaking Machine", the piano obtains an impalpable, ghostly persona. This animistic attribute is solidified with a fitting example from Maria Cizmic, where she cites an early 20th century critic's description of Cowell's performance (Cizmic, 2010:452):

The moment was tense. Few members of the audience could help feeling that if they were the piano, they would certainly get up and sock the fellow; and everybody glued his eyes upon the venerable instrument, expecting at any moment to see it rise on its hind legs, and deliver a swift one to his jaw with one of its forepaws.

It is not a coincidence that the critic chooses to personify the piano. The listener habitually tries to trace the voice back to its origin, yet the instrument proves to be an unfitting match for such a haunting sound. This discrepancy therefore elicits an uncanny feeling by posing an ambiguity through its human and nonhuman liminality.

²⁴ Although here the early 20th century audience is prioritized, one could argue that the effect still remains relevant today. As a more contemporary example, composer Helmut Lachenmann also uses the word "defamiliarization" to describe his "instrumental musique concrète" pieces. In these works, traditional instruments are again performed in unconventional ways so that the listener gets to "experience the familiar afresh" (Ryan & Lachenmann, 1999:21).

²⁵ Maria Cizmic shares a notable remark from an article written in 1926, in which the reviewer describes the action as "plucking 'at the entrails of the instrument'" (Cizmic, 2010:453). Considering the animistic implications of the piece, such an anthropomorphic description of the instrument appositely highlights its uncanniness.

“The Banshee” is not just alienating for the listener but for the performer as well. As a musicologist and a performer, Maria Cizmiciu points out how “The Banshee” asks the early 20th century (or even the contemporary) pianist to cast aside years of classical training and instead adopt highly physical and even painful performance techniques. In this context, she refers to a phenomenological term called “incorporation”, the act of being so familiar with an object or instrument that it functions as a part of one’s own body. The pianists who practice their instruments for years become highly intimate with the object, to the point that their interaction with the piano becomes reliant on an intrinsically fixated muscle memory. In a way, commanding the piano becomes not much different than commanding one’s own arms and legs. Therefore, when years of practice with an overly-familiar instrument is suddenly subverted, the pianist is made to go through a deeply alienating and corporeal rediscovery process. For a pianist whose cognitive wiring, expression, identity, or even livelihood is shaped by their mastery over the instrument, such an alienating experience can be seen akin to walking on prosthetic legs for the first time. “The Banshee’s” uncanniness can therefore transcend its musical boundaries and become a viscerally disturbing phenomenon. While the piece’s aural output can be analyzed from a Jentschian standpoint due to its vocal semblance, its physical necessities call for a more Freudian approach in the way it “dismembers” the classically trained performer from their instrument.

1.3.4. Tod Browning’s “Dracula” (1931)

The early sound cinema of the 20th century was popular with its Gothic film adaptations and Tod Browning’s “Dracula” is no exception. The original novel’s use

of religious themes, “repressed” cultural anxieties²⁶, undead bodies, and hidden identities has repeatedly been pointed out by theorists. Tod Browning’s movie, on the other hand, deserves a separate analysis of its own for its utilization of sound cinema’s capabilities.

Once more the story takes place in a rational world that harbors irrational threats: “Modern medical science does not admit of such a creature! The vampire is a pure myth, superstition!” exclaims Dr. Seward, to which Professor Van Helsing replies: “The superstition of yesterday can become the scientific reality of today”. Uncertainty and ambivalence play a key role in defining “Dracula”. The main antagonist again embodies a contrasting mixture of the wild beast and the cultured man; however, this time he is doubly threatening, because unlike Frankenstein’s monster, he has the manners and the appearance of a seductive aristocratic man. He is somebody who his victims would willingly invite home, to the breeding ground of the *unheimlich*.

Actor Bela Lugosi quickly became iconic for his portrayal of Count Dracula; his distinct Hungarian accent openly underlined his *otherness*, while his exaggerated physical gestures built an inhuman aura around him (Spadoni, 2007). His dragged out, commanding voice – which he uses to hypnotize his victims – has often been regarded as an entity of its own, even leading to the character to be described as a “lifeless machine showing a supreme sign of humanness in speech” (Elferen, 2012:45). This robotic aspect of the character was further amplified by Lugosi’s deliberate stillness in facial expression and the “canned sound quality” of his cinematic voice (Spadoni, 2007; Tinwell, 2015). Furthermore, the technical limitations of the early sound

²⁶ The vampire Count Dracula survives through the centuries by feeding on the blood of the living. His Freudian status as the “ancient evil” can be summed up with a quotation from Jonathan Harker, one of the leading protagonists in the novel: “(...) unless my senses deceive me, the old centuries had, and have, powers of their own which mere ‘modernity’ cannot kill” (Elmessiri, 1994).

cinema also contributed to the ghostliness of Lugosi's speech, as Angela Tinwell puts it: "[the] blatant discrepancies in the synchronization of speech with lip movement (...) represented a disembodiment of his voice with his physical body, thus enhancing the supernatural or ghostly qualities for this monster" (Tinwell, 2015:50).

In his book "Uncanny Bodies: The Coming of Sound Film and the Origins of the Horror Genre", Robert Spadoni asserts that Tod Browning's "Dracula" purposefully exploits a crossmodal mismatch between the voice and the image. He points out to a scene in the movie where Renfield, a victim of Dracula who loses his sanity, is laughing crazily in the cargo hold of a ship. The camera is at first pointed away from Renfield so that we only hear his laughter, and then the shot slowly moves towards the character, where we finally see him staring directly at the camera with a static grin on his face (Spadoni, 2007:59-60):

Renfield's laughter appears to float over this shot, how it remains strangely "off-screen" even after Renfield has appeared on screen. This laugh seems to us *near* Renfield's mouth but not quite *in* it (...) The separation derails the viewing experience and possibly sends it rattling into uncanny territory (...) There is no person there. The spirit of the person is elsewhere and does not inhabit this gray facsimile, this ghostly screen. Surely such a sensation qualifies as uncanny according to Jentsch's and Freud's criterion (...) of thinking something alive and then suddenly realizing otherwise.

The disembodied voice therefore serves as an uncanny element that emerges with sound cinema's technological capabilities. Much like in the psychoanalytic concept of the double, where the mirror image of a character attains a separate body of its own, this time the voice appears as a distinct entity severed from its original source. The

aural defamiliarization effect that we saw in Henry Cowell's "The Banshee" is now ascribed to an individual character in the story that is associated with the supernatural.

Spadoni further argues that the use of voice is especially effective in the film because of the overall lack of music and sound effects. The movie in general is very silent and slow-paced, there is no non-diegetic music and sounds are used sparingly. Therefore, the empty soundscape provides a large space for Dracula's suggestive voice to boom in (Spadoni, 2007). The character's voice, which is already infused with a supernatural character, becomes the inescapable center of attention. Within this context, Spadoni refers to the book "Composing for the Films" by Theodor Adorno and Hanns Eisler, in which they note that cinema without music can evoke a particular feeling where the human actors can be perceived as "speaking effigies".

The previous discussions on body and identity thus finds a new meaning in sound cinema, as the medium's technical capabilities introduce new methods of merging and separating the two concepts. The voice now solidifies its place in the list of human-like traits which artists can exploit to create uncanny figures. With the inclusion of the aural domain, we move from purely visual anthropomorphism towards a more complete image of uncanny embodiment. The following chapters will aim to demonstrate how factors such as bodily appearance, gesture, voice, and ambiguity appear in the uncanny valley concept, and how such elements are then translated to contemporary music works.

CHAPTER II

THE UNCANNY VALLEY

2.1. From the Uncanny to the Uncanny Valley

The uncanny, albeit being a modern concept, still serves to be a popular subject among theorist and artists today. Even though the concept is widely attributed to Freud, it also went through a substantial conceptualization process up until the late 20th century (Masschelein, 2011). The previous chapters aimed to demonstrate the concept's origins and how corporeality and anthropomorphism functioned within uncanny art. This chapter will be focusing on how the advancements in technology during the 20th century introduced a new angle to the uncanny and how this ultimately relates to anthropomorphism and Masahiro Mori's *uncanny valley* theory.

The uncanny potential of technology was already demonstrated in Chapter 1 through examples such as Kempelen's "Speaking Machine" or the automaton Olympia in "The Sandman". In all the relevant examples, the machines transgress their mechanical natures by portraying human-like behavior, thus blurring the line between the familiar and the unfamiliar. However, it is also crucial to acknowledge that the uncanniness of such machines does not only stem from their anthropomorphic features, but also from the fact that we are mostly unfamiliar to their inner workings. A complex piece of machinery, whether it possesses human-like attributes or not, already has the potential

of being an alien object to us, as we may be lacking the technical knowledge to be familiar with its internal mechanism. Although this estrangement does not initially have to result in an uncanny sentiment, the moment such a machine is given an “extra-mechanical” (e.g. a human-like) quality, the uncanny potential behind its technological enigma suddenly becomes unleashed. Therefore, we face an essential distinction between a machine’s interior and exterior, where the former constitutes the “soul”, the uncanny persona of the machine. In his article “Ambient Technologies, Uncanny Signs”, Christopher Johnson highlights this distinction through the automaton Olimpia from “The Sandman” (Johnson, 1999:130):

(...) however crude the (cybernetic) mechanism, from the point of view of the observer what it shares with the most contemporary (semiotic) control technologies is the fact of being *hidden*. The programme is in a sense the most ‘vital’ component of the machine, but it is not immediately manifest in the operations of the machine. It is the hiddenness of the programme that is the cause of our cognitive oscillation or intellectual uncertainty vis-à-vis Olympia.

Since a machine’s internal program is fundamentally an obscured construct, our perception attempts to fill its place by interpreting the machine’s exterior behavior as if it relates to a conscious mechanism (Richardson, 2016). Much like in Jentsch’s example of a “wild man” encountering a locomotive, our layman’s knowledge in intricate technologies can thus grant an animistic quality to technology and consequently fuel our technophobic skepticism. In other words, the less familiar we are with machines, the more uncanny their latent qualities can become. Within this context, one could refer to Arthur C. Clarke’s famous “Clarke’s three laws”²⁷, among

²⁷ Arthur C. Clarke is a highly popular science fiction author who also put forward “three laws” that would apply to fictions that relate to the future.

which the third one states: “Any sufficiently advanced technology is indistinguishable from magic” (Clarke, 1962/2013:489). This statement alone can perhaps explain how the uncanny, which we primarily identified within Gothic fiction and the supernatural, can now be assessed in regard to our relationship with technology. The rapid advancements in technology increasingly prevent us from mastering our own tools to the point that they become incomprehensible and thus “magical” to us. The present and the future unknown of technology therefore breed an uncertainty which ascribes an *otherness* to the machines. Consequently, the supernatural qualities that defined the uncanniness of figures such as Frankenstein’s monster, Dracula, or Olimpia now become transferred into modern technology. By taking on the role of the mysterious “other”, the machines attain a spectral aura and transcend their functional purposes.

From a historical perspective, humankind’s anxiety towards technology becomes particularly noticeable during the advent of industrialization (Binfield, 2004). Within the context of this period, technophobia can basically be assessed as a Freudian fear of being replaced by the “other” (Richardson, 2016). As the industrial machines start to fill human’s places in the labor market and outperform them in their tasks, humans in return become robbed of their sense of pride and identities²⁸. In her book “The Unconcept: The Freudian Uncanny in Late-Twentieth-Century Theory”, Anneleen Masschelein underlines how this relationship manifests itself in modern literature through a reference to Siegbert Praver, and Marx’s theory on alienation²⁹ (Masschelein, 2011:68):

²⁸ One early example to this conflict can be seen in an incident from 1675 where British workers in protest destroyed “power machines that could each do the work of several people” (Binfield, 2004:14).

²⁹ Karl Marx claimed that capitalist industrialization alienated workers from the products of their own labors by placing them in subsidiary positions next to the machines and assigning them repetitive and narrowed tasks (Leopold, 2018). However, Marx was also critical of the proletariat’s technophobia, as

The relation between the uncanny and the psychic forces of society is determined by secularization and alienation. Man is doubly alienated from his being (...) because in an industrialized society, he is deprived of control over his work. In nineteenth- and twentieth-century literature, the sense of alienation is reflected in a feeling of uncanniness in *things*. Man no longer has control over his world; therefore, the world of things seems strange and inimical. [italics added]

Once again, we observe how technological progress results in a shift from uncanny persons towards uncanny objects. As objects themselves start to attain alien personas, it becomes all the more possible for machines to take the leading roles as the prime antagonists. Their appearances, voices, movements, or functionalities carry their threatening status much higher than that of a simple object. Ultimately, one's deep-seated distrust towards technology behaves like a repressed superstitious fear; it is brushed aside as a trivial disturbance until an uncanny encounter finally resurfaces it.

The machine's position as the *doppelgänger* then sheds a new light on the implications that come with anthropomorphic technologies. Their human semblance supplements their uncanny threat, which is to replace us with all aspects of their being. In this regard, human-likeness constitutes the final and most essential component that bridges the *uncanny* to the *uncanny valley*³⁰. At this point, we can once again return to Ernst Jentsch's essay on the uncanny and reexamine the examples which he provided for his theory. Whether they relate to physical appearances, sounds, or personas, all of Jentsch's examples share two common

he believed that it was not the technologies themselves but rather their utilization within a capitalist society that caused this alienation (Wendling, 2009).

³⁰ The uncanny valley concept will be discussed in more detail in Chapter 2.2.

characteristics: firstly, they are all bound to intellectual uncertainty, and secondly, they are all deemed uncanny as a result of their anthropomorphic or pseudo-organic qualities. Jentsch's proposition that wax figures and automatons can be disturbing through their ambivalent nature is therefore in direct parallel with Masahiro Mori's uncanny valley hypothesis. As we shall also see in the following chapters, Mori claims that our circumstantial aesthetic distaste towards androids³¹ stems from their imperfect human-like features (Mori, 1970/2012). According to Mori, as machines are increasingly given anthropomorphic traits, we perceive them to be all the more unsettling, because they further fail to satisfy our conscious or unconscious expectations. Jentsch seems to have insightfully identified this effect almost seventy years before Mori's popular conceptualization. By mostly limiting his examples to anthropomorphic entities such as automatons and wax figures, he pinpoints a profound fear that pertains to our perceptual sensitivity towards human-likeness in non-human beings. Therefore, the experiences that Jentsch and Mori define as "uncanny" in such contexts are shown to be the one and the same. Furthermore, Jentsch forms yet another apposite connection to Mori's theory with his discussion on epileptic seizures (Jentsch, 1906/2008:14):

It is not unjustly that epilepsy is therefore spoken of as the *morbus sacer* ['sacred disease'], as an illness deriving not from the human world but from foreign and enigmatic spheres, for the epileptic attack of spasms reveals the human body to the viewer – the body that under normal conditions is so meaningful, expedient and unitary, functioning according to the directions of his consciousness – as an immensely complicated and delicate mechanism.

³¹ Machines that are modelled in human forms.

With this statement Jentsch essentially outlines the corporeal substance of the uncanny and makes a critical comparison between our bodily functions and “non-human” material processes. When we witness an epileptic seizure, the human body as we know it becomes defamiliarized to us, since we are made to realize its physicality in isolation from its ascribed identity. Such an experience may thus attack the boundary we hold between what we perceive to be “human” and “non-human”. The autonomous contractions of the muscles momentarily dehumanize the individual, as within that instance we can no longer observe the presence of a conscious will. Likewise, a machine that exhibits erratic behavior outside of its programmed purpose may also appear threatening; or even worse, one could be inclined to suspect the existence of an underlying malignant consciousness as a result of their “technological animism” (Richardson, 2016). What any of these examples show us is that whenever we face a situation where our human nature is reduced to a mechanical construct, our possible conviction in the Cartesian duality of body and soul suddenly becomes disturbed. In fact, one could readily imagine that a machine’s body may not be that different from our own; however, the moment we detect the semblance of a higher intelligence or a “soul” within its mechanical shell, then our own humanness and mortality gets put on the line. The machine’s purely material existence makes us question if a “soul” is truly even necessary to satisfy the old Cartesian model of a human being. Thus, all the elements which we have assessed in relation to the uncanny, such as human-likeness, corporeality, irrational fears, intellectual uncertainty, and threats to our ego, then find a new meaning within the context of anthropomorphic technologies. Masahiro Mori’s uncanny valley theory is especially notable for establishing this contextual relationship, as his hypothesis on human-like machines perpetuates a historical discussion on aesthetics and philosophy that

originated with the uncanny concept. As a consequence, the uncanny valley now serves as a spiritual successor of the former term and is often assessed under matching conditions (*The Uncanny*, n.d.).

2.2. Masahiro Mori's "Uncanny Valley" Theory

The 20th century gave birth to a new species of machines that are commonly named "social robots" (Fong, Nourbakhsh & Dautenhahn, 2003). With the emergence of social robots, machines were now not only built to perform industrial tasks, but also to interact with human beings (Kanda & Ishiguro, 2013). Features such as physical appearance, ability to perceive and portray emotions, speech, facial expression, and body language became significant aspects of a robot's functionality (Fong et al., 2003). Therefore, robot designers had to take into consideration how their products were perceived in terms of likability and trustfulness. Following the belief that humans would interact more positively with human-like machines, manufacturers started modeling their products in anthropomorphic shapes (Kanda & Ishiguro, 2013). Such machines, however, engendered a multitude of issues when faced with humans' innate sensitivity towards social behavior and appearances. Machines that were designed with high levels of realism thus received remarkably negative reactions due to their imperfect human forms (Fong et al., 2003). This adverse effect was first theorized by roboticist Masahiro Mori in his 1970 essay "The Uncanny Valley" (Mori, 1970/2012).

In "The Uncanny Valley", Masahiro Mori claims that our positive affinity towards an object is directly proportional to its human-likeness. However, when there arrives a point where the object becomes *almost* human, but *not quite*, the positive response suddenly tends to turn into repulsion. The object's extreme resemblance to a human

person causes an unsettling cognitive dissonance, and this discomforting perceptual zone between non-human and human is named the “uncanny valley”.

The term “uncanny valley” takes its name from a functional graph that Mori uses in his essay (see Fig. 1), on which the x-axis represents the human-likeness of an object and the y-axis represents our affinity towards it. Mori distributes different objects over the graph, such as industrial robots, toy robots, and prosthetic hands, depending on the objects’ human-likeness.

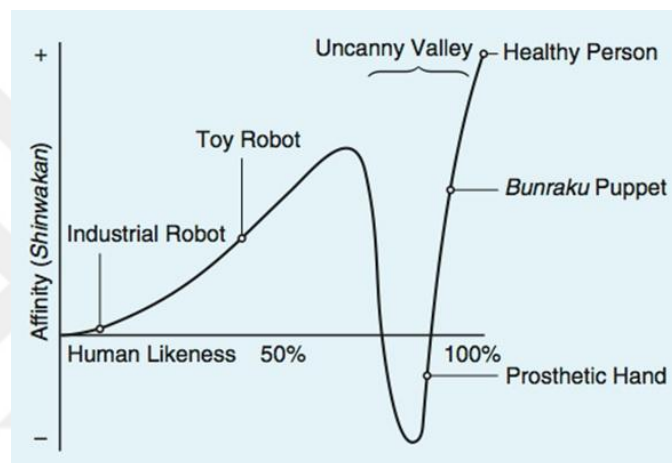


Figure 1: The Uncanny Valley (Mori, 1970/2012)

Mori claims that our affinity towards an industrial robot would mostly be neutral, because the machine is created for purely functional purposes and therefore its design is not meant to imitate the human form. The toy robot, on the other hand, is designed to be likable by its user, so its appearance is given a higher priority over its functional capabilities. Finally, Mori places a prosthetic hand towards the bottom of the valley and provides the following explanation for this correlation (Mori, 1970/2012):

One might say that the prosthetic hand has achieved a degree of resemblance to the human form, perhaps on a par with false teeth. However, when we realize the hand, which at first site looked real, is in fact artificial, we experience an

eerie sensation. For example, we could be startled during a handshake by its limp boneless grip together with its texture and coldness. When this happens, we lose our sense of affinity, and the hand becomes uncanny.

This example directly parallels Jentsch's proposition that doubting a lifeless object's animate state may cause an uncanny feeling to arise (Jentsch, 1906/2008). Because the object exists in a liminal state between "alive" and "dead", we may be inclined to code the image as potentially threatening³². Furthermore, Mori asserts that the effect does not only occur in relation to an object's appearance, but that it can also be triggered by its movement (see Fig. 2). Continuing with the same example, Mori claims that a myoelectric hand that is capable of motion would cause an even more intense uncanny reaction than a prosthetic hand. He likens such images to a dead person coming back to life, and also accordingly places a "zombie" at the very bottom of his graph. Within this context, we could once again return to some previous examples that were mentioned in Chapters 1.2 and 1.3; in particular, to Frankenstein's monster who became repulsive after becoming animate, and to Freud's reference to severed limbs that are moving on their own. In all of the examples, we see that movement in general can create a conflict regarding an object's supposed animate state, especially if that object partly or fully belongs to the human body. One last example which Mori provides in this regard is his account of a robot that was exhibited in 1970 World Exposition in Osaka, Japan (Mori, 1970/2012):

For example, one robot had 29 pairs of artificial muscles in the face (the same number as a human being) to make it smile in a humanlike fashion. According to the designer, a smile is a dynamic sequence of facial deformations, and the

³² See the further discussion in Chapter 2.2.1.

speed of the deformations is crucial. When the speed is cut in half in an attempt to make the robot bring up a smile more slowly, instead of looking happy, its expression turns creepy. This shows how, because of a variation in movement, something that has come to appear very close to human—like a robot, puppet, or prosthetic hand—could easily tumble down into the uncanny valley.

The artificial face that is meant to depict a “human” emotion evokes an uncanny sentiment, firstly by defamiliarizing the human face through its unnaturally slow motion, and secondly by revealing the human face itself to be a mechanical construct. One could even argue that the uncanny effect of the “slow” smile would be further amplified depending on the level of realism in the initial, “natural” smile. The more convincing and thus familiar a machine behaves, the more its latent uncanniness gets accentuated.

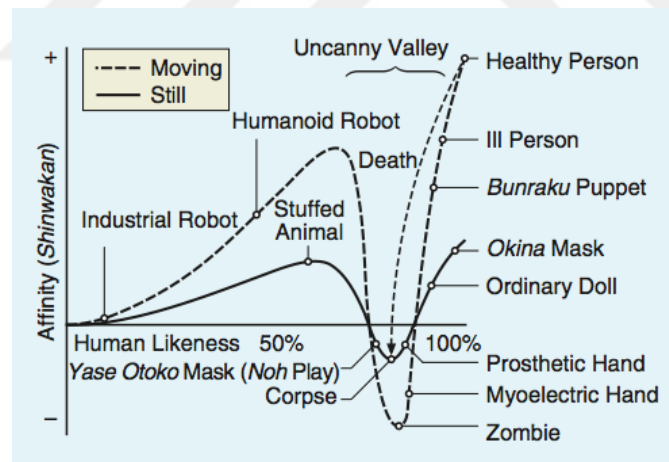


Figure 2: The Uncanny Valley, comparison of moving and still examples (Mori, 1970/2012)

2.2.1. Possible Explanations of the Phenomenon

In Mori’s essay, the uncanny valley is only put forward as a theory and is not supported by any empirical data other than his anecdotal accounts. However, the

theory since then has become a popular subject among researchers and several hypotheses have been posited to explain the cognitive and sociocultural factors behind the effect (Kätsyri, Förger, Mäkäraäinen & Takala, 2015; MacDorman & Entezari, 2015). Although it is not possible to claim with certainty that any single one of such factors can alone explain the uncanny valley (Ho, MacDorman & Pramono, 2008), it nonetheless becomes necessary to examine some of the relevant scientific literature in order to better understand the dynamics underlying the phenomenon.

According to Mori, the uncanny valley effect is fundamentally related to “our instinct for self-preservation” (Mori, 1970/2012). He suggests that when we see an uncanny anthropomorphic object such as a moving prosthetic hand, we are unconsciously reminded of death. This appositely Freudian premise later came to be called the *mortality salience hypothesis*, a key concept that is often assessed in conjunction with Greenberg, Pyszczynski, and Solomon’s *terror management theory* (Greenberg, Pyszczynski, Solomon, Simon & Breus, 1994; MacDorman & Ishiguro, 2006). The terror management theory particularly focuses on the conscious and unconscious reactions that we give when we are reminded of our own death and its inevitability. Accordingly, the relevant uncanny valley research suggests that our unconscious disturbances pertaining to human-like entities are in line with such death-related reactions. An example to this correlation can be found in an experimental study conducted by Karl F. MacDorman (MacDorman, 2005). In the experiment, test participants are either exposed to an “uncanny image of an android” or the photograph of a real person, along with some other images of regular objects. Afterwards, the subjects are asked to complete a questionnaire, which unbeknownst to them intends to reveal the intensity of their unconscious death-related thoughts. The results show that the subjects who saw the uncanny image were in average more likely to demonstrate

typical mortality salience defense mechanisms such as showing greater preference for their own worldview supporters³³, or giving higher ratings to nationalistic opinions in accordance with their worldviews (Greenberg et al., 1994; MacDorman, 2005). The same participants were also more inclined to give death and anxiety related answers to word completion puzzles. The study aims to support the claim that uncanny images or objects elicit eerie feelings because they unconsciously remind us of our mortality and consequently activate our psychical defenses.

A similar proposition to the mortality salience hypothesis is the *threat avoidance theory* (Chattopadhyay & MacDorman, 2016). This theory suggests that we might find certain anthropomorphic entities uncanny because of the possible conscious or unconscious threats that they pose to us (MacDorman & Entezari, 2015). For example, in her study on predictive coding of “human and humanoid robot actions”, Ayşe Pinar Saygin demonstrates through fMRI data that observing a human-like agent in motion can cause a prediction error in our brains, therefore violating our behavioral expectations and creating uncertainty (Saygin, Chaminade, Ishiguro, Driver & Frith, 2011). Likewise, Angela Tinwell suggests that the lack of upper facial movement in an animated human character can be perceived as uncanny because it resembles psychopathic and potentially dangerous behavior (Tinwell, Nabi & Charlton, 2013). Certain evolutionary self-preservation strategies such as pathogen avoidance and mate selection have also been proposed as part of the overarching threat avoidance theory³⁴

³³ In the case of this experiment, participants who saw the uncanny image were more likely to favor a “charismatic” political candidate over a “relationship-oriented” one.

³⁴ On the pathogen avoidance theory, Karl F. MacDorman writes: “(Christian) Keyesers posited that the uncanny valley is the result of an evolved mechanism for pathogen avoidance. The more human an organism looks, the stronger the aversion to its defects, because (1) defects indicate disease, (2) more human-looking organisms are more closely related to human beings genetically, and (3) the probability of contracting disease-causing bacteria, viruses, and other parasites increases with genetic similarity ...

(MacDorman, Green, Ho & Koch, 2009). Ultimately, the theory reveals that despite their human-made artificial nature, anthropomorphic entities such as androids or animated virtual characters can still be processed as alien threats. Our irritation towards such beings is thus compared to the reactions which we give when we encounter dead bodies (Moosa & Ud-Dean, 2010) or unpredictable and potentially dangerous persons (Tinwell et al., 2013).

Alongside cognitive and perceptual factors, one's religious or sociocultural beliefs may also lead them to find certain human-like beings uncanny (MacDorman & Entezari, 2015). In their paper "Individual differences predict sensitivity to the uncanny valley", Karl F. MacDorman and Steven O. Entezari identify several personality traits that may be more susceptible to the uncanny valley effect. Among these traits are also included subjective standpoints such as "religious fundamentalism", "negative attitudes towards robots", and "human-robot uniqueness" (MacDorman & Entezari, 2015:143). On the topic of "religious fundamentalism" the paper writes (MacDorman & Entezari, 2015:151):

First, fundamentalists adhere to a worldview that divides humanity from the rest of existence (MacDorman, Vasudevan, & Ho, 2009; Vail et al. 2010; Vess, Arndt, & Cox, 2012) (...) Androids as liminal objects appear to trespass the very boundary the fundamentalist worldview is determined to preserve, namely, between the realm of the human and the nonhuman (...) Second, androids may rekindle awareness of repressed fears that are especially pernicious to fundamentalists: A "soulless" machine assuming the role of a human being

A mechanism for pathogen avoidance would explain the strong tendency to be more sensitive to defects in our own species – and to defects in CG human characters and other human-looking entities ...” (MacDorman et al., 2009:696).

renders the soul functionally superfluous; (...) an android excites fears of replacement, both as a double and as the continuation of the body's shell in the absence of its soul (...)

Likewise, the “human-robot uniqueness” trait predicts that people who believe that humans are a unique species rather than just “complex physical mechanisms” will be more likely to be disturbed by categorical transgressions between human and non-human entities. In this regard, anthropomorphic figures with ambivalent features that create “perceptual tension” (Moore, 2012; MacDorman & Entezari, 2015) may be more unsettling for individuals who consider humans and machines to be mutually exclusive. Lastly, the “negative attitudes towards robots” category assumes a direct relationship between one's personal views and emotional responses. This category evaluates a person's deliberate hostility towards machines, but also considers the possibility of underlying hidden prejudices (MacDorman & Entezari, 2015:152):

Conflicting attitudes towards another group is ambivalent prejudice (Fiske, Xu, & Cuddy, 1999), such as when industrial robots are simultaneously viewed as freeing people from drudgery and taking away their jobs (MacDorman, Vasudevan, & Ho, 2009). These conflicting attitudes cause the psychological discomfort associated with cognitive dissonance (Ho, MacDorman, & Pramono, 2007; MacDorman et al., 2009).

Therefore, it is suggested that the negative attitudes can be caused by both conscious and unconscious biases. MacDorman and Entezari correlate all three of these attitudinal factors, as well as certain other personality traits³⁵ to the uncanny valley

³⁵ The individual personality traits are categorized as “animal reminder sensitivity”, “personal distress”, “perfectionism”, and “neuroticism and anxiety”. Among these categories, “animal reminder sensitivity” refers to one's awareness of their own “creatureliness” and is accordingly associated with both the

effect. The correlation is made through an experimental study conducted with a wide range of participants belonging to different groups of personality measurements. The participants are asked to rate six video clips of human and human-like entities based on their levels of humanness, eeriness, warmth, and competence. MacDorman and Entezari conclude that eight out of nine of their initially proposed categories have significant correlations with the uncanny valley effect³⁶. Thus, we can infer that cognitive processes and sentimental reflexes can be further reinforced by one's conscious beliefs regarding human-machine relationships.

The existing theories on mortality salience, threat avoidance, and individual traits may all be relevant in understanding how the uncanny valley functions in our perception. In accordance with the main objective of this thesis, being aware of the phenomenon's underlying principles will thus aid us as we trace the uncanny valley effect in contemporary music pieces. The following chapter will entirely focus on how the uncanny valley is utilized in contemporary music, and how composers have either willingly or unknowingly achieved this effect through their works.

mortality salience hypothesis and the threat avoidance theory. The remaining three categories are respectively concerned with empathetic processes, sensitivity towards imperfections, and proneness to anxiety.

³⁶ The ninth category named "Android-Robot Uniqueness" did not show any significant correlations with the uncanny valley effect.

CHAPTER III

THE UNCANNY VALLEY IN CONTEMPORARY MUSIC

Masahiro Mori put forward his uncanny valley theory as a problem that particularly concerns the field of robotics; however, as we have already observed throughout the previous chapters, the relationship between uncanniness and anthropomorphism long predates the 20th century invention of social robots. Mori himself was insightfully aware of this relationship, which is why he included a variety of “non-mechanical” examples in his essay such as “zombies” or Japanese *Noh* masks. We can therefore argue that although the term *uncanny valley* was initially used to point to a design issue regarding anthropomorphic technologies, its extent can be expanded considerably under the umbrella of the *uncanny* concept. The term can ultimately be applied to any entity which causes a disturbance through its liminal, human-like qualities. Whether it be a wax figure, an animated character, a robot, or even a real human being, as long as its uncanny aspect stems from its distorted humanness, it can be assessed within the context of the uncanny valley. Taking this basic premise as a starting point, we can then shift our focus onto the domain of contemporary music and try to analyze how a musical work can manage to elicit the uncanny valley effect through its anthropomorphic components. For this purpose, this thesis will propose a categorized selection of what such components may be and then aim to identify them

within certain contemporary music examples³⁷. The objective of this analysis will be to reveal how the uncanny valley effect can be implemented in music as the continuation of a historical aesthetic that pertains to uncanny art³⁸. However, it is also important to note that the composers who are referenced in this study may very well not have intended any connection between their works and the uncanny concept. Therefore, other than a few explicit examples, it will be presumed by default that the creators of these pieces were not consciously concerned with the uncanny valley, neither as a subject nor as a compositional element. In this regard, the selected composers should not be viewed as the successors of a historical aesthetic that relates to uncanny art. In fact, it could be said that many of these composers represent a diverse set of backgrounds and compositional approaches. Nonetheless, this study will aim to demonstrate that the uncanny valley effect still fulfills a significant function within their referenced works and constitutes a considerable portion of the affect that is evoked by these pieces. For this reason, it is rather the perspective of this analysis than the composers' intention which places the relevant works into a pertinent historical context.

The existent hypotheses that attempt to explain the uncanny valley effect, such as mortality salience, threat avoidance, and various other theories based on individual traits, can give us an idea about how the phenomenon operates; however, to be able to

³⁷ In accordance with the subject of this thesis, the works will all be selected among music that is written after 1970, which is the year when Mori wrote "The Uncanny Valley". Rather than attempting to devise an exhaustive list of all contemporary music that utilize the uncanny valley effect, this study will focus on a limited number of works which are all thought to be clear representatives of their ascribed categories. Therefore, the number of selected works will be equal to the total number of categories and subcategories that relate to the uncanny valley. In cases which a single work encompasses several categories at the same time, one prominent category will be prioritized, but the remaining categories will also be included in the analysis.

³⁸ See Chapter 1.3.

identify the uncanny valley within music, one would first have to decide what causes the effect in the first place. For this reason, we first have to examine the surface level stimuli that trigger the uncanny effect. These stimuli or causal factors will consist of a list of categorized components which can then be identified in compositional works. Here, the primary claim is that the pieces which are the subject of this study obtain their uncanny qualities through their utilization or defamiliarization of the listed components, often in relation to anthropomorphism. Each piece will be matched with one category, followed by a discussion on how that particular category contributes to the uncanniness of the selected work. The categories are designated as follows: Bodily Appearance, Bodily Motion (Gesture, Facial Expression, Corporeality), Speech, Voice, Persona, Crossmodal Mismatch, and Fiction.

3.1. Uncanny Valley Categories

3.1.1. Bodily Appearance

Bodily appearance is one of the most commonly researched factors that relate to the uncanny valley. This category is concerned with the observable physical traits of human or other anthropomorphic entities, and the uncanny effect that results from the deformation of such traits. Aspects such as anomalous facial and bodily proportions, skin texture and color, and the differing levels of realism among physical features may all contribute to the effect (MacDorman & Chattopadhyay, 2015). This category has been associated with several theories based on the uncanny valley; such as the mortality salience hypothesis, because an uncanny appearance may trigger death-related thoughts (Mori, 1970/2012; MacDorman, 2005), threat avoidance theory, because it may trigger one's sensitivity towards unfit mates and pathogens (Moosa & Ud-Dean, 2010; MacDorman & Entezari, 2015), and other cognitive and attitudinal

disturbances that may stem from category confusion and perceptual tension³⁹
(MacDorman & Entezari, 2015).

3.1.2. Bodily Motion

Masahiro Mori claimed that bodily movement further amplifies the uncanniness of an anthropomorphic entity (Mori, 1970/2012). This category is examined under three subcategories: Gesture, Facial Expression, and Corporeality.

Gesture relates to any bodily motion that can communicate an idea or meaning to the observer. It is closely associated with the threat avoidance theory, because our ability to predict and understand one's actions directly informs our expectations regarding their possible intent (Tinwell, 2015). Likewise, incongruent actions may also conflict with our innate cognitive skills that "support our communicative and social behaviors" (Hofree, Urgan, Winkielman & Saygin, 2015:2). Therefore, an incompatibility between an entity's appearance and movement may again result in category confusion and perceptual tension (Saygin et al., 2011; MacDorman & Entezari, 2015).

Facial expressions also play a prominent role in human communication and can be effective in triggering uncanny responses. The types of emotions that are expressed by an entity, as well as the appearance and quality of its expressions can directly influence our negative perception (Ho et al., 2008). The uncanny effect of unnatural facial expressions can also be explained through the threat avoidance theory. For

³⁹ Category confusion relates to the overall uncertainty that is caused by not being able to tell if an entity is actually human or not. Likewise, perceptual tension occurs when the anthropomorphic features of an entity exhibit differing levels of realism, such as realistic hair vs. poorly animated skin texture (MacDorman & Entezari, 2015).

example, a lacking facial expression can be perceived as threatening, as it resembles psychopathic and potentially dangerous behavior (Tinwell et al., 2013).

Lastly, corporeality applies to instances in which an entity's bodily features are uncannily accentuated through motion. The abnormality of a physical trait can be further emphasized by an action; or conversely, an action can defamiliarize an otherwise normal bodily feature. This category therefore explores how motion can alter our perception of a body's physical aspects. The difference between corporeality and gesture is that corporeal actions create focus on one's physicality rather than their semantic body language. Therefore, the material body is rendered uncanny as a direct result of its animate state, regardless of the message that it is conveying.

3.1.3. Speech

Similar to facial expressions and gestures, speech is also a category that relates to our communicative abilities. In this regard, an anomalous speech that sends ambivalent signals to the receiver may likewise be perceived as uncanny. Existing research on the uncanny valley suggests that our cognitive responses which relate to the linguistic domain in our brains can also be triggered by non-linguistic semantic stimuli such as bodily gestures (Urgen, Kutas & Saygin, 2019). Therefore, the previous discussion on prediction errors that arise from observing irregular body movements also applies to abnormal speech behavior that violates our expectations. For example, we would normally expect the sentence "I take coffee with cream and ____" to end with the word "sugar" rather than the word "dog", which constitutes a linguistic expectation (Urgen et al., 2019:7).

3.1.4. Voice

While speech is assessed in relation to its semantic content, the voice carries importance for its acoustical properties. Within this context, the voice functions the same way as any other identifiable component of the human body and its deformation thus elicits a similar uncanny effect. An unnatural pacing, timbre, or intonation may render a voice uncanny (Spadoni, 2007), which directly influences the perceived human-likeness of an entity. Furthermore, as a distinctly recognizable yet invisible anthropomorphic component, a disembodied voice may also create the impression of a ghostly persona (Elferen, 2012) or ascribe a human-like quality to non-human entities (Dolar, 2006). In this regard, the voice category can additionally be associated with theories that explain the uncanny valley through attitudinal factors such as religious fundamentalism or human-robot uniqueness (MacDorman & Entezari, 2015).

3.1.5. Persona

The persona of a human-like entity might encompass factors such as intelligence and personality. These factors can decide the nature of our interactions with non-human beings and consequently test our ego in relation to their attitudes. While their intelligence can challenge our claim on sapience as humans, their personality may threaten us depending on the hierarchical dynamics of our exchange. A socially unresponsive being can make us feel rejected and damage our self-worth (Tinwell, 2015), or its negative character traits might trigger adverse emotions (Zibrek, Kokkinara & McDonnell 2018). For example, uncanny valley research that examines virtual interactions with artificial characters shows that a character with an

introverted, neurotic, or non agreeable personality can induce concern and unease in human subjects (Zibrek et al., 2018).

3.1.6. Crossmodal Mismatch

Crossmodal mismatch is used for instances in which one type of sensory stimuli creates a conflict with another. For example, in his essay “The Uncanny Valley”, Mori asserts that a prosthetic hand may seem convincingly real at first sight; however, if we were then to shake that same hand, its “limp boneless grip together with its texture and coldness” (Mori, 1970/2012) can suddenly shock us. This discrepancy between visual and tactile stimuli can thus cause an uncanny effect. Similarly, Angela Tinwell puts forward that lip synchronization errors in voiced virtual characters can create a mismatch between visual and aural stimuli and therefore appear threatening to the viewer (Tinwell, 2015). Such effects can disturb us by causing cognitive dissonance or evoking uncanny supernatural imagery.

3.1.7. Fiction

The fiction category is concerned with any narrative element within a work that contributes to the uncanny quality of a character or the piece in general. For example, in Mary Shelley’s “Frankenstein”, the uncanniness of the monster is greatly enhanced by the underlying religious and supernatural themes of the story⁴⁰. Research on the uncanny valley suggests that emotional factors such as empathy, sympathy, and pleasure can directly be influenced by the personalities of non-human fictional characters and the narrative outcome of a story (MacDorman, 2019). The narrative aspects of a story can therefore alter or supplement our attitudes towards uncanny entities.

⁴⁰ See Chapter 1.3.

3.2. The Uncanny Valley in Contemporary Music

3.2.1. Bodily Appearance in Unsuk Chin's "Alice in Wonderland" (2004-07)⁴¹

Lewis Carroll's "Alice's Adventures in Wonderland" tells the story of a young girl named Alice who goes out on a surreal adventure in a fictional, dreamlike world.

Unsuk Chin's opera adaptation of the novel, on the other hand, transforms this dreamy setting into a grotesque nightmare⁴². The deliberate aesthetic choices made by the opera's composer Unsuk Chin, director Achim Freyer, and costume designer Nina Weitzner collectively establish a sinister tone which feeds from ambiguity, dark humor, and death-related imagery. The stage work is replete with uncanny elements and thus offers a rich ground for analysis in regard to the uncanny valley phenomenon. Chapter 3.2.1 will primarily focus on the uncanny valley effect that is elicited through bodily appearances and costume design, but will also underline other visual and aural aspects that pertain to the uncanny concept. Since the "Bodily Appearance" category is fundamentally concerned with visual stimuli, the analysis will mostly address the spectacle elements of the stage work; however, we shall also see later in the chapter that Unsuk Chin's music significantly contributes to the overall uncanny atmosphere as well.

The setting in "Alice in Wonderland" is deliberately designed to look like a puppet theatre. The stage is built diagonal in the shape of a ramp, on which many of the performers stand by hanging from elastic ropes. The singers, who all wear fanciful clothes and excessive make up, seldom move from their designated spots. The music is highly eclectic and is often subjected to rapid changes, playing dense dissonant

⁴¹ This analysis is based on the Bayerische Staatsoper performance with conductor Kent Nagano which premiered in 2007 (*Alice in Wonderland*, n.d.).

⁴² Los Angeles Times calls it "a dream opera with a dark side" (*Alice in Wonderland*, n.d.).

textures in one scene and a lighthearted children's song in the next. All these elements are effectively implemented in order to transform what would otherwise be a graphic horror show into a grotesque and whimsical fantasy. In this regard, there is always the hint of a dark secret in "Alice in Wonderland"; but this secret is actively being repressed and camouflaged behind a colorful mask. This liminality between the frightening and the comical serves as the main source of ambiguity in the opera. The puppet-like characters' extreme emotional displays make them difficult to empathize with, which in return dehumanizes them⁴³. Their behavior and appearances continuously subvert our expectations and their human forms are frequently disfigured. The human versus non-human dichotomy that is at the core of the uncanny valley phenomenon therefore plays a central role in the opera through the theme of puppetry.

Starting from the very opening, one of the most striking and unsettling aspects of the opera is its characters' visual design. All throughout the performance, the protagonist Alice, like many of the other figures, wears an oversized mask on her head that obscures the actual face of the soprano singer (see Fig. 3). The mask has an extravagantly cartoonish face painted over it with an exaggerated dollish make up, disproportionately large eyes, sparse and stringy hair, and an unusually pale skin with

⁴³ One could say that in "Alice in Wonderland", contrasting sentiments such as pain and joy are often merged together so that they become indistinguishable. This particular duality can perhaps best be explained with the Lacanian term *jouissance*. In Lacanian psychoanalysis, the term is used to denote a certain threshold in our ability to feel pleasure. Lacan claims that when we exceed our own pleasure limit, the surplus pleasure conversely turns into pain, and this painful pleasure is named *jouissance* (Evans, 1996). In "Alice in Wonderland", the characters' joy are always displayed in such an excessive manner that one can almost sense a feeling of danger underneath. For example, in the fifth scene of the opera, we see a group of characters having a "mad tea party", singing songs and asking riddles to each other. However, it is soon revealed that this celebration has a torturous aspect to it, because the characters are actually trapped inside a periodic cycle where it is perpetually teatime.

a porous texture. It depicts a frozen and neutral facial expression that does not convey any particular emotion. Alice's remaining body stands small in comparison, over which she wears an outworn, dirtied dress. The only bare body parts of the singer are her arms, which are also painted to look unnaturally pale. All of these features together create an uncanny impression for a variety of reasons. First of all, the bulky head with the abnormally large eyes violate a tested design principle which states that disproportionate bodily features, and especially oversized eyes, can elicit an uncanny feeling within the observer (Tinwell, 2015:26-27):

It was suggested that designers should implement any manipulations in a character's facial proportion with caution, and, as Jun'ichiro Seyama and Ruth Nagayama (2007) found, a high degree of abnormality in a character's facial features exaggerated the uncanny. For example scaling the eyes to 150 percent of their original size may make a human-like character appear less realistic and more uncanny.

Likewise, Alice's unhealthy looking skin and hair might trigger typical repulsion responses that relate to pathogen avoidance and mate selection theories⁴⁴ (MacDorman et al., 2009). In relation to the mate selection theory, Karl F. MacDorman asserts that qualities such as "youth, vitality, skin quality, bilateral symmetry, familiarity, and nearly ideal facial proportions all enhance attractiveness" (MacDorman et al., 2009:697), features which are mostly inverted in Alice's appearance⁴⁵. Furthermore, Alice's extremely light complexion makes her seem like a dead person or an inanimate doll, which directly relates to the mortality salience

⁴⁴ See Chapter 2.2.1.

⁴⁵ Within the context of the mate selection theory, the listed visual traits should be assessed independently from the subject itself. The viewer does not consciously have to consider the subject as a potential mate in order to be objectively repulsed by their physical features.

hypothesis (MacDorman, 2005). The unchanging stillness of her mask further supplements this factor, and additionally poses a bizarre contrast with her animate human body. This particular type of contrast which stems from the combination of human and non-human features is considered to be one of the main causal factors behind the uncanny valley effect, as the “perceptual tension” theory states (Moore, 2012:2):

(...) conflicting perceptual cues can give rise to *differential* distortion in the region of a category boundary, and that such distortion would be manifest as a form of perceptual ‘tension’. The idea is that such tension may be experienced as physical or emotional discomfort, e.g. feelings of eeriness or creepiness.

The uncanny effect of the visual mismatch between the mask and the body can also be explained through cognitive prediction errors that relate to our behavioral expectations regarding human and non-human appearances (Saygin et al., 2011). The organic body movements and the inanimate mask simultaneously send clashing signals to the brain, which can cause a disturbing psychical uncertainty⁴⁶.



Figure 3: Alice (Contemporary Classical, 2015)

⁴⁶ See the further discussion in Chapter 3.2.2.

Perhaps the most significant function of the mask in “Alice in Wonderland” is to create ambiguity, as it constantly obscures the actual facial expressions of the singer. This factor becomes especially noticeable during scenes where the character is visibly in distress. For example, in the sixth scene of the opera, as the Queen of Hearts is violently commanding her minions to behead those whom she disapproves of, Alice is seen raising her arms and covering her face in shock. However, the neutral facial expression painted on her mask completely contradicts her agitated body language, therefore causing an alienating effect for the observer. According to Angela Tinwell, we can unconsciously associate such passive emotional displays with psychopathic traits⁴⁷ (Tinwell, 2015:106):

Given that this inherent lack of the startle reflex in response to frightening or shocking stimuli is a known visual facial marker for those with psychopathic traits, I hypothetically linked this with the results of my earlier study on uncanniness in characters with aberrant facial expression. This earlier experiment revealed that the uncanny was strongest in a character when presenting the emotions fear and surprise without movement in the eyelids, eyebrows and forehead (Tinwell et al., 2011).

One could thus claim that the uncanny effect that is elicited through the mask plays a key function in the opera. Its perturbing impact is sustained up until the very last section of the piece. In the final scene, Alice manages to escape her own execution by breaking the illusion of the Wonderland. This act is symbolized through Alice removing her mask for the first time in the entirety of the opera. As Alice’s real face is ultimately revealed, all the other characters start fading away and Alice begins to

⁴⁷ See the further discussion in Chapter 3.2.3.

sing her final aria. This section is followed by masses of climatic orchestral chords, which Alice embraces with euphoric bliss. Her clear expression of joy at the very end serves as a resolution to the whole alienating tension that has been present throughout the piece. In a way, we come to realize that the mask which had placed a distance between the audience and Alice also places a distance between Alice and reality by trapping her inside a surreal nightmare⁴⁸.

The puppetry setting in the opera is also used to play on typical uncanny themes such as disembodiment and doubling (*doppelgänger*). Characters in “Alice in Wonderland” are often duplicated on stage with the use of additional inanimate puppets. This factor can become especially disorienting since the original “copies” often look like puppets themselves. The recurring doubling effect accordingly supplements one of the primary motifs in the opera, which is the questioning of identity in relation to one’s body. Throughout the story, Alice’s conception of reality is frequently challenged through her sense of selfhood. Alice begins to doubt her own authenticity as her body constantly goes through physical changes such as shrinking and growing. These bodily transformations are almost always depicted with the use of inanimate duplicates, therefore allowing bizarre physical deformations which would not be possible to achieve with human performers. However, since the inanimate doubles serve as the visual representations of their authentic models, we are forced to imagine as if their graphic disfigurements are actually exerted on the human performers themselves. For example, in the second scene of the opera, after Alice eats a cake that

⁴⁸ Unlike Alice, some of the characters in the opera are enacted by singers who do not wear any masks. Conversely, these performers exhibit unnaturally exaggerated facial expressions, which is another known causal factor of the uncanny valley phenomenon (Tinwell, 2015). This effect can be more closely associated with the “Bodily Motion” category, as it pertains to facial movement rather than a still depiction.

makes her body grow into a giant size, a large puppet duplicate of hers enters the stage behind her back (see Fig. 4). The figure floats above her and stretches meters long, upon which Alice starts singing the words: “Who in the world am I? Ah, that’s the great puzzle!” Most notably, the duplicate figure’s eyes are pierced through with a pair of ropes that are tied to the ground, depicting a disturbing mutilation which we cannot help but imagine being done to Alice herself. Furthermore, we can see that the floating puppet’s arms are actually enacted by a real performer, thus forming an uncanny combination of human and non-human components.

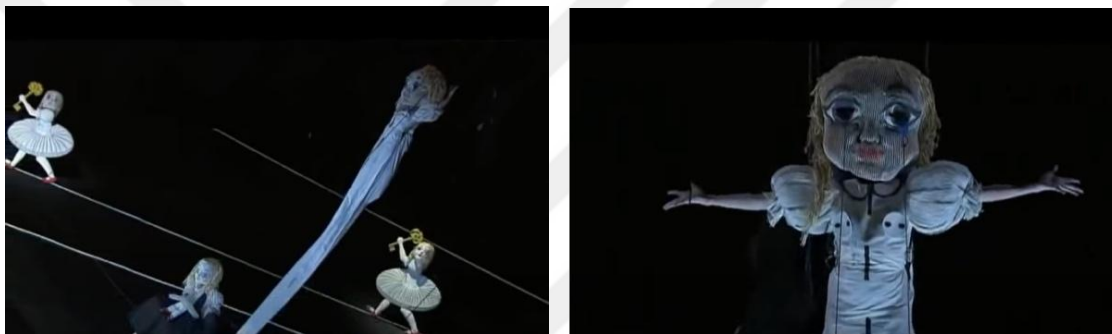


Figure 4: On the left, Alice is standing at the bottom as her double is stretching above her. There are also multiple inanimate duplicates on stage. On the right, a close-up on Alice’s floating double with pierced eyes and actual human arms (Contemporary Classical, 2015).

A similar instance occurs during the first interlude, where the Caterpillar – whose head is also a duplicate of Alice’s - asks Alice “Who are you?” Meanwhile, we see Alice slowly assembling the pieces of a doll of herself. However, just as Alice finishes putting the doll together, the scene takes a dramatic turn. The lights suddenly shift in color, and this time Alice starts tearing the doll apart limb by limb (see Fig. 5). She begins by decapitating the doll and waving the parts around, as if she is taking a

sadomasochistic pleasure out of her own dismemberment⁴⁹. The Caterpillar then continues on questioning Alice's identity, and adds on to the graphic imagery of the scene with his words:

Who are you? To live, you surmise, is to go on changing size. No corset can contain, though they will provide some pain, all the swelling and the bloat of your fleshy overcoat. Then you'll shrink another night and become a parasite, squiggling, squirming, through the mud, in your search for fresher blood.



Figure 5: Alice disassembling the doll (Contemporary Classical, 2015).

Once more the body is presented as a physical vessel for selfhood over which one's identity can be questioned⁵⁰. The distortion of Alice's image therefore not only serves as an uncanny visual effect, but also complements a major literary theme in the story. Many of the remaining characters in the opera also portray unsettling physical deformations, such as the Queen of Hearts with her amorphous body merged with her

⁴⁹ The frozen expression on her face as she is disassembling the doll once again brings to mind Angela Tinwell's theory on psychopathic traits and their relation to uncanny facial expressions (Tinwell, 2015).

⁵⁰ This exact theme was also present in Edgar Allan Poe's short story "The Man That Was Used Up", where the material distinction between corporeality and identity was explored through General Smith's dismembered body (See Chapter 1.3).

servants, the Cheshire Cat and its many transformations with multiple eyes and pointy teeth, and the Old Men with their phallic shaped noses (see Fig. 6). Ultimately, the duplication allows a critical distinction between the singer, who embodies the main persona of the character, and the doubles, who serve as the visual representations. The separation of the voice and body is an essential feature of all puppet shows; however, the simultaneous physical presence of both the performers and the puppets on stage particularly highlights their disembodied relationship. Since our attention is primarily focused on the vocalists, the personification of their physical duplicates cannot function as convincingly as it would in a conventional puppet theatre. For this reason, the puppets in “Alice in Wonderland” can never be recognized as authentic characters, and thus their presence only reinforces their status as uncanny, dehumanized objects⁵¹.

Unsub Chin’s music appositely reflects many of the key elements in the stage work such as ambivalence, physical disfigurement, and anthropomorphism. The opera remarkably begins in complete silence. We see Alice appear for the first time, accompanied by a multitude of performers aligned on stage, whose white arms pose a total contrast to their camouflaged black clothing. Alice and the ensemble of severed arms⁵² then start gesturing cryptic signs to the audience with no musical accompaniment whatsoever. Within the context of this scene, one could argue that the

⁵¹ In several examples such as the Queen of Hearts or Alice’s enlarged puppet in Scene II, the doubles are also enacted by human performers. In such instances, the puppet performers act in a highly stylized, inorganic fashion, thus evoking an uncanny effect through their unnatural bodily motions.

⁵² The motif of severed limbs and body parts frequently recur in “Alice in Wonderland”. In Scene III, Alice’s overgrown arms and legs independently float across the stage; while in Scene V, the clock’s numbers are made up of severed human arms. This Freudian motif can especially be associated with the Queen of Hearts, who has a strong obsession with dismemberment. In Scene VI, the queen sings a piece that is wholly dedicated to this motif: “So many heads and so little time, so many limbs and so many tongues. And oh! Such a pretty lawn. Heads off! Ah, heads off and all those other parts!”

primary source of ambiguity behind the performers' gestures comes from the total lack of sound. We see Alice and the performers visibly communicating a message to us and accordingly expect to hear a sound that matches their movements; however, the expected sounds are not there. The composer purposefully creates a mismatch between the image and sound, therefore coating the performers' actions with a veil of ambivalence. Similar combinations of performance and sound occur in multiple occasions throughout the piece in order to achieve various uncanny effects. For example, in the fourth scene of the opera, Alice gets hold of a tortured baby who is being poorly treated by its caretakers. While Alice is calming the baby, we notice that the child has a terribly disfigured face which can look both like an infant and a pig at the same time depending on the angle it is being observed at (see Fig. 7). Alice begins to sing a tender lullaby to the baby in C major tonality, accompanied by soft, sustained chords in the accordion. However, at some point during her lullaby, Alice starts turning the face of the baby upside down so that its image switches from that of a human into a pig. Right at this instant, the second clarinet plays a disruptive tritone interval, followed by a D-sharp diminished seventh arpeggiation in the first clarinet. The dissonant figurations in the clarinets, together with the rising tension in the strings, blur the cadential effect in the vocal melody that weakly resolves into a C note. This tonal tension that is introduced right at the moment of an uncanny optical twist is perpetuated until the end of the lullaby, where Alice finally sings another sustained C note with a clear C major seventh chord provided by the strings. The visual ambiguity that is tied to the dual-faced baby is therefore matched with tonal ambivalence in the music. The uncanny valley effect mainly functions through the puppet's bodily appearance, but the music is also effectively utilized to amplify this factor.



Figure 6: From left to right: The Queen of Hearts, the Cheshire Cat, and the Old Men (Contemporary Classical, 2015).

Much like the puppets and characters in “Alice in Wonderland”, the music itself can also portray anthropomorphic qualities. This most notably occurs in the first interlude, where the Caterpillar performs a lengthy monologue. The monologue, however, is actually a bass clarinet solo and therefore does not contain any spoken words. Instead, the bass clarinet is made to sound like the Caterpillar’s speech and is accordingly given a human-like character. Unsuk Chin’s performance instructions to the clarinetist are as follows: “By playing his bass clarinet, the Caterpillar will ‘speak’ his lines, which are projected as text” (Chin, 2007). The monologue can only be understood by matching the ongoing clarinet solo with the projected words on stage. The Caterpillar’s “voice” is thus musically stylized, but also has a conspicuous vocal quality. The choice of personifying the music in such a literal way resonates strongly with the overall play on anthropomorphism and disfigurement in the opera. The musical modification of the Caterpillar’s voice, which is also occasionally distorted with sudden fortissimo multiphonics, functions as yet another method of defamiliarizing the human image. The uncanny factor in “Alice in Wonderland” consequently gains an aural layer through Unsuk Chin’s artistic contribution.



Figure 7: The dual-faced baby that looks both like a human and a pig (Contemporary Classical, 2015).

3.2.2. Gesture in Alexander Schubert’s “Point Ones” (2012)

Alexander Schubert’s “Point Ones” is a work written for “augmented conductor and small ensemble”. As its instrumentation suggests, the piece ascribes a central role to the conductor and accordingly treats him⁵³ as a soloist. “Point Ones” is thus envisioned as a somewhat theatrical piece. The music is written with a conscious awareness of classical concert hall traditions, and its dramatic aspect lies in the way how Schubert purposefully plays with those conventions. The classical role of the conductor is partly maintained; however more importantly, the conductor is also expected to act as an individual performer who deviates from the ensemble. The uncanny effect in “Point Ones” is born as a result of this intended discrepancy between the conductor and the rest of the musicians. Alexander Schubert deliberately dehumanizes the conductor by making him dysfunctional and machine-like, and this

⁵³ This analysis is based on Nadar Ensemble’s performance of the piece with Daan Janssens as the conductor (Alexander Schubert, 2012).

idea is mainly translated to the viewer through the conductor's choreographed gestures⁵⁴.

One could say that a conductor's main tool of communication is their body. Their characteristic gestures and persona on stage, which Schubert defines on the score as "traditional conducting" (Score Follower, 2018), has long become a familiar aspect for the common classical music audience. In "Point Ones", these typical gestures are not only used for their usual semantic purposes; but also to elicit a certain defamiliarization effect. This effect primarily stems from the conductor's anomalous bodily motions which also serve a musical function. For the performance of the piece, the conductor is required to wear motion sensors that can remotely trigger electronic sounds. The conductor therefore influences the music by both directing the ensemble and triggering sounds with his body. This aspect of the piece, however, also breeds certain peculiarities. From a practical point of view, the conductor is inclined to use much stiffer and sharper movements so that the motion sensors can accurately detect his gestures. Although this might seem as a basic necessity, the composer's overall intention with the piece and his deliberate choice of sounds indicate that this is in fact a desired effect. The immediate simultaneity between the conductor's actions and their sonic result creates the impression that the conductor might be the genuine

⁵⁴ Gesture is an essential part of Alexander Schubert's work. His pieces "Your Fox's a Dirty Gold" (2011), "Laplace Tiger" (2009), "Sensate Focus" (2014), and "HELLO" (2014) all deal with gesture and "gestural codes". In an interview entitled "Flaws in the Body and How We Work with Them", Schubert states: "... there might also be particular aspects of the performers' approach to gesture that I want to focus on. Some of the newer pieces about gesture are about an artificial, digital representations of the body ... For example, in *Point Ones*, the conductor's gestures go from traditional conducting movements to almost robotic movements, where he's falsely giving cues to the musicians and where the whole system isn't working anymore ..." (Kanga & Schubert, 2016:8).

source of the triggered sounds. Therefore, the conductor is made to seem like he is an integrated part of the piece of sound technology himself. This factor is greatly enhanced by Schubert's overall compositional style. His implementation of raw synthesizer and metronome sounds, MIDI instruments, mechanically precise time signatures, abrupt pauses, and identical glitch-like repetitions is reflective of a digitalized, technological aesthetic. Schubert thus conceptually transforms the conductor into a machine by forming a technical and visual connection between the conductor's gestures and the aforementioned musical elements.

The idea to make the conductor become perceived as a machine is also reflected on the music's score. At the beginning of the piece, the conductor is asked to perform in a "traditional conducting" style with minimal instructions; however, as the piece progresses, Schubert starts introducing more unconventional performance elements such as "small shaking hand movement" or "short shakes of left hand". These actions at first seem like temporary anomalies, until a crucial moment arrives at measure 133, on which the score indicates (Score Follower, 2018):

Strong, wild movements (both arms) – for the whole section until cue 79
continuous movement controls "granular ensemble sounds" and strong hits
trigger chord-like sounds, DO NOT CONDUCT THE ENSEMBLE, DO NOT
follow the dynamics of the ensemble – act as a soloist and fill the gaps of the
ensemble with electronics.

During this instance, the conductor's body seems to be physically glitching together with the music, creating the impression that he is malfunctioning like a machine with

no control over his own body⁵⁵. This theatrical element recurs all throughout the piece, most notably on measure 180 which is marked as “Conductor Solo”. The instructions of the solo are as follows: “Roughly 1 minute long. Combination of strong movements, small shaking movements, PAUSES, comic elements (if you feel like it), gestures taken from conducting or something else. The material should become sparse at the end of the solo”. The idea of a conductor acting as a soloist not only results in a visual idiosyncrasy, but also contradicts the whole purpose of a conductor in the first place. This deliberate trivialization of the conductor’s stage persona consequently transforms him into a mere mechanical object. A similar instance occurs in measure 214, where the conductor is asked to “evoke the feeling as if trying to conduct the ensemble”. During this brief section, the conductor repeatedly gestures the ensemble to play a sound; but the ensemble only responds with odd, rigid motions, accompanied by digital “Error” noises. Likewise, on measure 224, the score instructs the conductor to go to “sleep mode” and “let arms and head hang, low tension”. Lastly, on measure 253, the instructions write (Score Follower, 2018):

From this point in the piece until the end: Perform almost all gestures based on traditional conducting (giving cue to different musicians, stop signs, pause signs and everything else you can think of). There should be a strange discrepancy between the movement and what the audience expects from it and the sonic (electronic) result. Decide which gestures to use for which cue and notate them in your score.

⁵⁵ The resulting visual effect here can be compared to Jentsch’s example of epileptic seizures. Jentsch stated that “the epileptic attack of spasms reveals the human body to the viewer” and creates the impression that the person’s body is under the control of alien forces outside one’s own consciousness (Jentsch, 1906/2008) (See Chapter 2.1).

The composer's inclusion of technological terminology and his relevant use of theatrical elements serve his intention of ascribing a machine-like character to the conductor and the ensemble. The concept of "Point Ones" therefore strongly correlates to the uncanny valley phenomenon in regard to how it depicts an in-between zone between the human and the machine. The utilization of gestures and perceptual inconsistencies with the purpose of subverting the audience's expectations is congruent with various cognitive and evolutionary theories based on the uncanny valley. For example, in her paper "The thing that should not be: predictive coding and the uncanny valley in perceiving human and humanoid robot actions", Ayşe Pınar Saygın demonstrates that our cognitive responses to android movements (machines with human-like appearances) significantly differ from those of biological humans and robots (machines with machine-like appearances). She suggests that this is because androids cover a liminal zone between humans and robots, and therefore cause prediction errors regarding our categorizations of the observed agents (Saygın et al., 2011). Furthermore, she adds that similar prediction errors could also occur when observing humans with machine-like movements⁵⁶, as it is the case in Schubert's "Point Ones"⁵⁷. Such processing conflicts can thus explain why humans who portray mechanical motions may seem uncanny to us. Keeping Saygın's theory on prediction errors in mind, it might be useful to reiterate Schubert's intention in

⁵⁶ Saygın refers to a study by Sotaro Shimada which demonstrates our widely differing cognitive responses to human virtual characters with human-like motions versus human virtual characters with machine-like motions (Shimada, 2010; Saygın et al., 2011).

⁵⁷ This correlation can become especially meaningful considering the social function of our action perception system. Saygın points out that performing a particular action and observing someone else perform the same action can actually trigger the same neuron in our brains. According to some researchers, this factor can suggest that our action perception system may thus "constitute a basis for social cognition" by linking "self" and "other" (Rizzolatti & Craighero, 2004; Saygın, 2012:2). Observing the irregular movements of the conductor in "Point Ones" can therefore cause a disruption in this process, or even prompt an unpleasant association with the "self".

“Point Ones” by referring to an excerpt from the piece’s program notes: “(...) the piece tries to play with the vocabulary of the conductor and the anticipations and traditions connected to those gestures. It is not always predictable what the result of the conductor’s movement will be” (Alexander Schubert, 2012). Whether Schubert wanted his piece to evoke an uncanny sentiment or not, it is certain that he nonetheless aimed for an alienating effect by dehumanizing the conductor and subverting classical concert hall traditions. Consequently, the performer’s identity as a conductor and a human being both become distorted⁵⁸. Thus, it is demonstrated through Schubert’s work that the gestural codes which dictate our everyday social interactions can purposefully be impaired in order to achieve uncanny effects.

3.2.3. Facial Expression in Francesco Filidei’s “I Funerali dell’Anarchico Serantini” (2006)

Francesco Filidei’s “I Funerali dell’Anarchico Serantini”⁵⁹ is a piece written for six performers. The work is about the death of Franco Serantini, an orphan who got murdered by the police at the age of 21 for protesting at a demonstration in 1972. According to Filidei, the piece can be considered as a funeral rite “in which the performers, sitting at a black table, let loose of any restraint, clicking their tongues, snapping their fingers, breathing, clapping their hands, kissing, coughing, screaming” (N.N., n.d.). The actions that are listed above are ironically performed with absolute “restraint” in “I Funerali”. The performers are expected to maintain an extremely stiff

⁵⁸ One could argue that this dual relationship is also supplemented by the fact that the conductor always has his back turned to the audience. Although this is the standard performing position for conductors, within the context of “Point Ones”, this factor further contributes to the alienating effect of the piece. The resulting image can be compared to paintings such as “The Son of Man” or “Not to Be Reproduced” by René Magritte, who is also an artist associated with the uncanny aesthetic (Freer, 2012).

⁵⁹ The Funeral of the Anarchist Serantini

posture throughout their performances and most of their movements are executed in an instantaneous, precise manner. Likewise, their actions and facial expressions never display any emotions, and more importantly, the instances which do seem to convey emotions are highly ambiguous. In a way, the choreography insinuates that the ensemble members do not have full control over their own bodies, but they are rather automated like mechanical dolls. This image is also supplemented by the fact that the piece is strictly choreographed and requires a tight synchronization among performers. The combination of all these elements results in a remarkably inorganic performance, which once again ascribes a dehumanized quality to the piece. The uncanny valley effect is therefore immediately observable in “I Funerali”; firstly through the musicians’ bodily motions, but most conspicuously in their tense facial expressions.

“I Funerali” is mostly an unvoiced music in which the performers only use their own bodies and a table as their instruments. Although the piece eventually builds up towards louder clapping and screaming sections, the majority of the music consists of moderately quiet sounds such as breathing, whistling, and gasping. In this regard, “I Funerali” is reminiscent of Unsuk Chin’s “Alice in Wonderland’s” opening scene, where an all-encompassing silence establishes an unsettling anticipation. This feeling of anticipation pervades the entire piece and consequently glues our attention on the performing musicians. “I Funerali” is therefore a considerably intimate work; it brings the viewer face to face with the performers and elicits the semblance of a communication in between. The deliberate omission of musical instruments and the fact that the performers are sitting at a table especially contribute to this effect by directing our focus on the performers’ faces. However, due to the highly artificial and vague physical expressions of the ensemble, trying to make meaning out of this

supposed communication only breeds more uncertainty. The instinctive need to understand the portrayed gestural codes is hindered by the unfitting silence and the overall ambivalence surrounding the ensemble's actions.



Figure 8: A scene from Ghent Advanced Master Ensemble's performance of "I Funerali dell'Anarchico Serantini" (Tom Pauwels, 2013).

Every single gesture in "I Funerali" is performed with the intention of producing a sound, with only one exception: about halfway into the piece, there arrives a striking moment where all the performers but one cover their heads on the table, while the remaining person leans forward and opens their mouth as if they are about to scream (see Fig. 8). However, despite what their action suggests, the performer does not vocalize any sound but simply stares forward with their mouth wide open. This silent facial expression, which also repeats in several other instances throughout the performance, marks the point where the piece transforms from simply being ambivalent to being uncanny. The moment arrives as a surprise, as up until then the performers never break their flat facial expressions. What is especially notable about this expression is that despite looking like a scream, the gesture still lacks a lot of the natural features that would normally come with such an action. The performer stagnantly leans forward with their hands on the table; their blank gaze is fixed on the

audience and their posture is unwavering. The action is then broken with the same mechanical manner and the performer immediately returns to their original position. The gesture therefore lacks the necessary emotional connotation; we cannot detect the urgency of fear, shock, or anger within the expression. Additionally, since the action does not serve an aural function, it inclines us to search for an extramusical meaning in the gesture, which further blurs the communication⁶⁰. There are also instances in the piece where similarly grotesque facial expressions are initiated to produce sounds such as lip smacking and teeth chattering, and although those expressions also look blatantly artificial, their effect would arguably be weaker if the initial “silent scream” did not precede them. The uncanniness of the silent scream resides in the fact that it is purely theatrical; it is not placed there to contribute to the sound pool but rather to accentuate the underlying terror behind “I Funerali’s” subject matter.



Figure 9: A close-up from G.A.M.E.’s performance of “I Funerali”. This time the “silent scream” is executed by another ensemble member (Sound & Body, n.d.).

The uncanny valley phenomenon is strongly associated with artificial forms that fail to deliver authentic looking facial expressions. Masahiro Mori himself outlined this

⁶⁰ Considering that the piece is about a young man who got murdered for participating in a protest, one could speculate that the lack of the actual scream symbolizes the silenced voices of the protestors.

factor in his original essay, where he shared his account of a robot with 29 pairs of facial muscles that was designed to emulate a natural smile⁶¹ (Mori, 1970/2012). In their paper on human emotions and the uncanny valley, Ho, MacDorman, and Pramono state that facial expressions play a particularly significant role in eliciting the uncanny valley effect, especially if the expression is reflective of fear, disgust, shock, or nervousness (Ho et al., 2008). They further add that it might not necessarily be the overall human-likeness of a subject that renders them uncanny, but rather the mismatch among their varying human-like features such as “form, motion quality, or interactivity” (Ho et al., 2008:176). In addition, Angela Tinwell asserts that a lack of emotional expressivity can make a character seem uncanny because the viewer may become confused regarding the character’s emotional state (Tinwell, 2015:83):

Any observed incongruence alerts people to oddness and the possibility of unpredictability of behavior which is alarming (even distressing and scary) as it may present a potential threat to personal safety. Hence, the sensation of uncanniness may serve to act as a sign of unpredictability and danger. (p.746)

Virtually all of the aspects mentioned above also apply for Filidei’s “I Funerali”. The performers display facial expressions that could be associated with fear or shock; however, the overall strangeness of their behaviors blurs the supposed meaning behind their actions. Furthermore, their lack of emotional expressivity and the artificial stiffness of their gestures pose a disturbing mismatch with their human appearances. When such elements are filtered through the contextual references in the work such as murder, censorship, and police brutality, the result can become an uncanny experience to the viewer. “I Funerali” therefore constitutes a great example

⁶¹ Likewise, Chapter 1.3 discussed how the character Dracula was likened to a machine due to his unnaturally still facial expressions (Spadoni, 2007; Tinwell, 2015) (See Chapter 2.2 & 1.3.).

to how our sensitivity towards facial expressions can direct our emotional responses, and how this simple effect can alter the entire perception of a musical work.

3.2.4. Corporeality in Katharina Rosenberger's "Quartet - Bodies in Performance" (2018)

"Quartet - Bodies in Performance" is a video installation work written for piano, percussion, violoncello, and accordion. Each musician's performance is filmed and recorded individually, and then the videos are played altogether in loops of varying lengths. Rosenberger explains her piece as follows (*Quartet – Bodies in Performance*, 2018):

The audience does not see the performers actually playing the instruments; rather, its attention is directed at the anatomy of the performers' backs, which are carefully illuminated against an infinite black backdrop. The back muscles, which are animated by the performance gestures, almost seem to dance to the sounds produced. Thus, the music is visualized in the moving body, emphasizing the rhythm, crescendo, and accelerandi and drawing listeners into the essence of the physical strain of years of intense practice on the muscles.

The very idea behind "Bodies in Performance" is based on an act of defamiliarization. Unlike the common concert experience where the performers and their instruments are visible to the audience, Rosenberger chooses to conceal the actual performance in order to create a particular focus on the performers' bodies. She purposefully chooses to exhibit the performers' backs, first of all to hide the instruments from sight, but also to depersonalize the performer so that the audience's attention can be diverted to their bodies instead. As a result, the audience gets to observe a continually

transforming flesh landscape whose every instance is shaped by the musical performance.



Figure 10: Scenes from “Quartet – Bodies in Performance”. Each video is played independent from each other (*Quartet – Bodies in Performance*, 2018).

The subject of “Bodies in Performance” is the human body itself; however, the work isolates the body in such a way that it is virtually robbed of its own human essence. We are presented with a faceless, flat surface without an identity: it has skin, bones, muscles, and extremities; but no distinct persona to associate with. In a way, the displayed part of the body can be interpreted as a separate living, breathing organism that looks both human and non-human at the same time. On the other hand, the alienating effect of the work can also be highly situational. For the most part, one might feel like they are simply watching an instrumental performance, until an instantaneous, fleeting moment temporarily breaks this perception. Therefore, the uncanniness of “Bodies in Performance” is mostly fueled by the viewer’s own impression; it depends on one’s ability and willingness to dissociate the image from the observed individual. The fact that the performed instruments are hidden away

from sight further facilitates this alienation. Those who might not be very familiar with the instruments' unidiomatic sounds may be more inclined to misinterpret their auditory signification. For instance, a listener might potentially mistake the forte air sounds of the accordion for inhuman breathing noises produced by the performer or have difficulty with associating the piercing timbre of the bowed piano strings with the piano instrument. The concealment of the instruments can thus introduce an additional aural layer to the uncanny experience.

Rosenberger applies a zoom-in on the performers' bodies in order to offer a unique perspective on the corporeal aspect of musical performance; however, by doing so, she also neutralizes the performers' personas. When a specific part of the body becomes isolated from its whole, it starts to become perceived as an autonomous anthropomorphic object that is devoid of a human identity. This idea of disassembling and manipulating the human form as a physical construct is a common characteristic in uncanny art. In this regard, one could refer to artists such as Hans Bellmer (Brown, 2008), Louise Bourgeois (Speaks, 2009), or Mike Kelley (Masschelein, 2011), all of whose works touch upon the human body and the concept of the uncanny. Taking a brief look at the methods and intentions of such artists may thus provide an indirect perspective regarding how Rosenberger's work might relate to uncanny art. Among the aforementioned artists, Hans Bellmer notably wrote: "The body resembles a sentence that seems to invite us to dismantle it into its component letters, so that its true meanings may be revealed ever anew through an endless stream of anagrams" (as cited in Brown, 2008). Bellmer was particularly interested in the "ambivalence of the body" (Brown, 2008:239) and famously constructed anthropomorphic dolls that explored this concept (see Fig. 11). His approach of dismantling the human body in order to reveal new corporeal meanings resonates strongly with the idea behind

“Bodies in Performance”. Rosenberger similarly assesses the body as a divisible form for the purpose of accentuating an unfamiliar bodily reality. Likewise, in both cases the bodies are defamiliarized to the extent that they gain an objective, material identity. For this reason, although the concept of the uncanny might have been irrelevant to Rosenberger’s artistic vision, her method of framing the performers’ bodies produces apposite results.

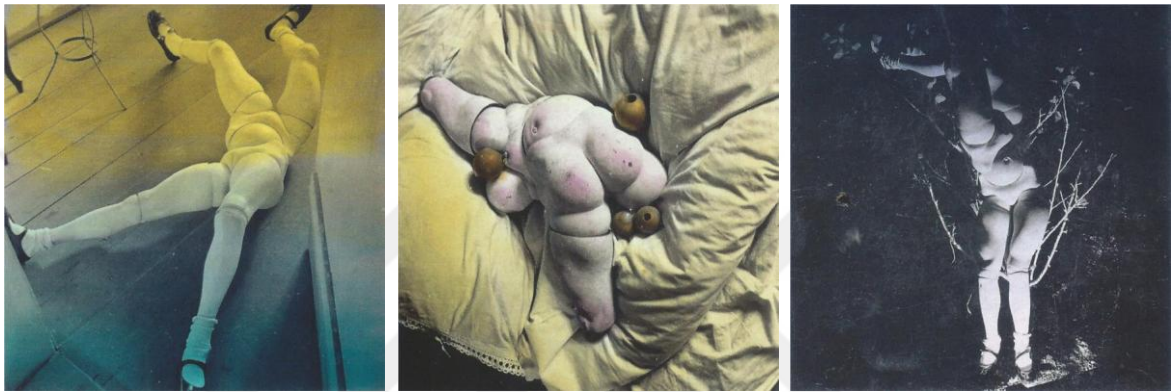


Figure 11: Examples from Hans Bellmer’s “The Doll”, a photograph series of his sculptures through which he explored new “anatomical possibilities” (Brown, 2008:235; Hans Bellmer: List of works, n.d.).

Ultimately, the uncanny effect in “Bodies in Performance” is dependent on the degree of familiarity that is elicited by the portrayed image. In uncanny valley research, this relationship is commonly measured on a “familiarity versus strangeness” scale. While familiarity pertains to the positive affinity or closeness that can be felt towards a subject, strangeness refers to overall feelings of coldness and eeriness. In Rosenberger’s work, the subjects are unmodified, biological human bodies; but the unique perspective from which the bodies are presented to us renders them less familiar. Their human forms are depersonalized and do not exhibit a possible medium for interaction, which reduces their possibility of eliciting a positive affinity or warmth. According to Chattopadhyay and MacDorman, an anthropomorphic entity

that appears unfamiliar can elicit “cold, eerie feelings and avoidance behavior” (Chattopadhyay & MacDorman, 2016:15). The researchers propose that “(...) perceiving small deviations from human appearance could produce large prediction errors in brain regions honed for recognizing human faces, hands, and bodies, thus engendering the cold, eerie feelings associated with the uncanny valley” (Chattopadhyay & MacDorman, 2016:3). In “Bodies in Performance”, this unfamiliar aspect primarily stems from the peculiar framing of the human form. The method of isolation breaks the visual integrity of the body and consequently transforms it into a relatively more ambiguous, corporeal object. At the same time, the performing motions accentuate the organic qualities of the body by perpetuating its animate state. The result becomes a highly explicit, yet also somewhat uncanny experience that offers a novel perspective on the human body.

3.2.5. Speech in John Gibson’s “Uncanny Valley” (2012)⁶²

“Uncanny Valley” is an electroacoustic piece for piano and a reader. The work is written by composer John Gibson in collaboration with poet Jon Woodward, who is also the author of the poem entitled “Uncanny Valley” (2012). The piece is divided into sixteen sections and each section portrays a different musical setting onto which Jon Woodward reads out his poem. According to Woodward, the poem tells the “mythic creation story of a car crash” (Harvard University, 2013). The program notes describe the piece as follows: “Extending outward from the phenomenon of “semantic satiation” (whereby a single word loses all apparent meaning and identity when repeated for even a short duration), this program searches out what is most uncanny, and most human, in both language and music” (Harvard University, 2013). Before the

⁶² This analysis is based on Oni Buchanan (piano) and Jon Woodward’s (reader) performance of the piece (Harvard University, 2013).

concert performance, Jon Woodward makes a brief introduction to the piece by explaining Mori's concept of the uncanny valley to the audience. He asserts that the poem accordingly aims to achieve the same effect through linguistic means by situating the human language on a spectrum of human-likeness⁶³.

Gibson and Woodward's "Uncanny Valley" can be compared to Schubert's "Point Ones"; both pieces aim to create an unsettling semantic ambiguity; however, the former does it through spoken language while the latter works with physical gestures. Likewise, dehumanization is also a key element in "Uncanny Valley". The reader is again ascribed a machine-like personality in order to depict an in-between zone between the human and non-human. Accordingly, the piano and electronic accompaniment also enhances this effect in both musical and technical ways, which will further be discussed in this chapter. Ultimately, the piece aims to defamiliarize the human language by manipulating linguistic elements such as syntax, semantic signification, phonemes, speech intonation, and vocal timbre.

Even without the accompaniment of music, Jon Woodward's poem can already be regarded as a musical composition by itself. As Rae Armantrout also describes in her review: "It stutters out a kind of music: repeated phrases which accumulate errors and mutate as they go like chromosomes or, as Woodward puts it better, 'visible fissile ribbons'" (*Uncanny Valley: Poems*, 2012). Woodward's material treatment of words, phrases, and phonemes underlines the importance which he attributes to their sounds in comparison to their semantic meanings (Field, 2013). In this regard, much like how the human body was objectified in the works of Chin, Schubert, Filidei, and

⁶³ Although Woodward accurately uses the term "human-likeness" to describe Mori's graph of the uncanny valley, perhaps the term "familiarity" would be better suited when the effect is applied to poetry.

Rosenberger, here we witness an objectification of the human language. The poem is replete with incessant repetitions; often times lines and phrases repeat themselves, either identically, or by going through gradual transformations. While the identical repetitions are intended to cause an alienating *jamais vu*⁶⁴ effect, the gradually transforming lines blur the listener's short-term memory by creating semantic ambivalence. The listener is constantly made to compare a spoken line with its previous repetitions, which ultimately causes a cognitive exhaustion. Furthermore, the repetitions are always delivered with the exact same intonation, thus contributing to the overall mechanical monotonousness of the performance⁶⁵. This effect is also occasionally accentuated by rhythmic irregularities in speech, such as when Woodward abruptly continues a phrase from where he left off after repeating a word several times. In such cases, his apparent unawareness of his own anomalous behavior creates the impression that he is malfunctioning like a machine, or perhaps that he lacks control over his own behaviors or consciousness.

In addition to the mechanical repetitions, Woodward also distorts the syntactic and phonetic structure of language by displacing words and sounds within the poem. For example, in the eighth section of the piece, the line "Driving upon the underside of a flying snake in flight" is immediately followed by the altered repetition "Driving upon considered the underside of a snake in flight". Here, the word "considered" is actually taken from an earlier line in the poem which goes: "The Sun was considered an ancient and important symbol". This seemingly random reappearance of the word

⁶⁴ Merriam-Webster's Online Medical Dictionary defines *jamais vu* as "a disorder of memory characterized by the illusion that the familiar is being encountered for the first time" (Merriam-Webster, n.d.). As described in the work's program notes, the repetitions are intended to trivialize the words' meanings by causing "semantic satiation" (Harvard University, 2013).

⁶⁵ In her book "The Uncanny Valley in Games & Animation", Angela Tinwell writes that the monotonousness of a voice can be a contributing factor to its uncanniness (Tinwell, 2015).

“considered” not only disturbs the meaning and the syntactic integrity of the phrase, but also triggers the listener’s short-term memory by making a subtle call-back. Similarly, in the sixth section of the piece, we hear the following lines spoken in succession: “A seven-sided star made of knuckles”, “A seven-sided star make of knuckles”, “A seven-sided stark make of knuckles”. Here, the phoneme “k”, which originates from the word “knuckles”, starts to leak into the other words within the phrase, therefore gradually obscuring the meaning of the message. Meanwhile, the spoken “k” sound is also constantly repeated with a granular delay in the electronics. This deliberate blurring of language aims to confound the listener and continually cause a discrepancy between their expectations and the text.

While Woodward’s poem constitutes the backbone of the piece, Gibson’s music serves to accentuate the text’s inherent uncanniness. Each section of the piece is mostly limited to a singular mood and the sections rarely follow any dramatic progression. The music rather provides a suspended atmosphere which accordingly complements the overall semantic ambiguity of the poem. On the piano, Gibson makes ample use of abrupt, staccati notes, atonal figurations, and long, sustained pitches, as well as certain extended techniques to achieve acoustic noise sounds. The rhythmic figurations occasionally reflect the poem’s broken linguistic structure by imitating the irregular, fragmented quality of Woodward’s speech. A clear example to this can be found at the end of the sixth section, where Woodward keeps repeating altering versions of the phrase: “Give k-back to fissile ribbon f-figurine”. Underneath the voice, the piano continually plays awkwardly stuttering rhythmic figurations which match the syntactically and phonetically convoluted form of the iterated phrase. At the same time, the electronics provide a third layer in which the same spoken phrase is dissected into smaller phonetic units and gets played back through a robotic

voice. The three separate layers all sound like alternate versions of each other and therefore collectively highlight the mechanical fabric of the text.

The electronics in the piece play a key role in defining the overall machine-like quality of Woodward's performance. Gibson predominantly uses basic waveforms and customary synthesizer sounds to emphasize a digitized aesthetic and to establish an artificial musical setting to the text. Furthermore, the electronics are also frequently used to double, fragment, and repeat the reader's voice through the loudspeakers on stage. The canned sound quality of the electronic double adds a metallic tint to Woodward's speech, often sounding like a robotic unconscious that echoes the poet's thoughts. These two voices are occasionally used interchangeably, such as in the tenth section of the piece where the acoustic and electronic voices successively complete each other's phrases, or at the beginning of the fourteenth section where we expect to hear Woodward's real voice, but a glitching electronic double surprises us instead. The blurring of the line among the actual voice and its electronic counterparts appositely highlights the close proximity between the human and the machine, which serves as a major theme in the work. In many instances, the electronic voice is also filtered or granulated with digital effects, thus ascribing a further inorganic quality to the performance. One notable example to this occurs in the eleventh section of the piece: the music begins with a digitally manipulated, monstrous screaming sound, doubled by the scraping of the bass strings on the piano. The reader then starts speaking in a casual manner, uttering the phrase: "There was this like, pipe, like a plumbing pipe". However, just as we expect him to continue his story, his speech suddenly turns into gibberish; he starts mispronouncing the words as if he is having a stroke and eventually gets stuck in a loop. While the reader continuously repeats himself over and over again, the electronics join in and echo the same nonsensical

word with an overcrowded, robotic delay effect. The combination of all these elements creates the impression that we are witnessing a malfunctioning simulation and that the reader is in fact operating on an artificial consciousness. In certain sections of the piece, the music also portrays similarly aberrant behavior, such as in the seventh section where a jazz recording suddenly starts playing from the loudspeakers, or the twelfth section which unexpectedly starts as a soothing, tonal piano piece. These brief musical excerpts deceptively offer us a feeling of safety; however, their utterly misplaced appearance signals a subtle threat instead. Therefore, the listener can never fully surrender to the music, as even such seemingly innocent moments can harbor uncanny realities⁶⁶.

Jon Woodward explains in the introduction of the concert that the poem “Uncanny Valley” tells the story of a car crash. As the listeners, we can never really hold onto a coherent narration in the piece but can only grasp what we can salvage from the reader’s highly ambiguous delivery. The imagery of a car crash therefore accompanies us all throughout the work, but most of its details are left to our own imagination. In a way, this is how “Uncanny Valley” functions as an entire experience; rather than presenting us a clear picture of what transpires in the story, the piece instead infiltrates our thoughts on a more visceral level. The convoluted language pushes us for an active listening and the subtle anomalies constantly evoke the feeling that something is always slightly wrong. This aspect of the work is congruent with how the uncanny valley phenomenon operates in general. In her paper “Uncanny valley as a window into predictive processing in the social brain”, Burcu

⁶⁶ If the music was ever to be measured on a “familiar versus strangeness” scale, as human-like objects often are in uncanny valley studies, then one could hypothesize that the jazz and tonal sections of the piece would be situated in an uncanny zone in-between. While the genre-based sounds provide a familiar facet to the listener, their ill-suited placements in the piece renders them relatively strange.

Ürgen asserts that the cognitive mechanisms which dictate our perceptions of other individuals are predictive in nature (Ürgen et al., 2019). Our innate skill to process semantic stimuli lets us anticipate other individuals' actions, which means that any violation of such predictive processes could make us feel that we are in a dangerous situation. Ürgen points out that our anticipatory reaction mechanisms respond with relatively greater amplitudes towards disruptive semantic stimuli, and that this effect was initially discovered in the linguistic domain of our brains (Ürgen et al., 2019). Gibson and Woodward's work accordingly exploits this phenomenon by sending mixed semantic signals to the listeners' brains in order to elicit the uncanny valley effect. The piece intends to subvert both our linguistic and musical listening habits through semantic satiation, dysfunctional speech behavior, and relevant musical signaling. Our spoken language therefore serves as yet another human element which artists can defamiliarize to invade our ingrained cognitive processes.

3.2.6. Voice in Peter Ablinger's "Quadraturen III" (1996 - Ongoing)

Peter Ablinger's "Quadraturen III" is an installation piece written for the automated player piano. Ablinger defines his work as "phonorealistic", a term which he derives from the "photo-realism"⁶⁷ movement in art (*Phonorealism*, 2005). Each piece is created with the same process: an acoustic recording gets divided into sets of short time frames and then every frame is analyzed for its frequency data. Afterwards, the data is transcribed into MIDI notation for the player piano to perform in its entirety. As a result, the original recording becomes thoroughly reproduced by the acoustic instrument, which generates a strikingly lifelike yet still conspicuously artificial

⁶⁷ Photo-realism is an American art movement that takes photography as its main source of inspiration. Photo-realist painters intend to simulate the reproduced reality of photography and therefore aim at painting extremely realistic images (Wainright, 2019).

effect. Ablinger describes his artistic intentions as follows: “(...) my main concern is not the literal reproduction itself but precisely this border-zone between abstract musical structure and the sudden shift into recognition – the relationship between musical qualities and ‘phonorealism’: the observation of ‘reality’ via ‘music’” (*Phonorealism*, 2005). What makes “Quadraturen III” so relevant to the uncanny valley concept is that alongside noises, music, and street sounds, Ablinger also reproduces the human voice through the player piano. The experience of hearing a convincingly realistic voice being played through a purely mechanical construct accordingly evokes an uncanny effect. Within this context, it is not just the spoken words or the semantic signaling that is what causes the uncanniness, but the direct acoustic replication of the voice as well⁶⁸. Therefore, just as Mori pointed out how engineers’ endeavors in building realistic anthropomorphic robots produce disturbing results, here we see that music can also elicit the same effect by crossing the uncanny threshold towards physical human-likeness.

On his website page for “Quadraturen III”, Ablinger shares the following excerpt from Chico Mello’s book entitled “Mimesis und musikalische Konstruktion”⁶⁹ (*Peter Ablinger - Quadraturen*, 2006):

The piano imitates the human voice and at the same time operates as an alienated recording and reproducing device. It has thus been replaced as traditional musical instrument: no artist operates it in order to play music. It becomes an oversized phonograph which is not used for the production of previously composed music but for the reproduction of the human voice. The

⁶⁸ Although in certain instances, the meaning that is conveyed in the speech recordings can also contribute to the uncanny effect.

⁶⁹ “Mimesis and musical construction”

sudden comprehensibility of single words, whenever the piano becomes the faithful representation of language, equally has the effect of a phantom's abrupt appearance: the close up reality of the voice is a ghostly apparition – as though the “forbidden” border between dream (music) and reality (language) had been crossed.

The text's reference to ghostly apparitions in regard to Ablinger's music is highly pertinent to the concept of the uncanny. Much like in Jentsch's example of locomotives that produce vocalized noises, or Henry Cowell's solo piano piece “The Banshee”⁷⁰, we once again observe that the occurrence of human-like sounds without the actual agency of human beings can ascribe a spectral persona to non-human objects. In relation to this acousmatic effect, we could once more refer to a statement from Isabella van Elferen which was initially presented in Chapter 1.2: “Sound suggests presence even when this presence is invisible or intangible, and is thus closely related to the ghostly” (Elferen, 2012:4). Ablinger's player piano convincingly produces a voice without the physical presence of a human person and thus effectively creates this ghostly impression. On the other hand, what notably separates “Quadraturen III” from the other aforementioned examples is that the sounds in “Quadraturen” are in fact derived from actual voice recordings. Therefore, not only the sounds end up being significantly more realistic and human-like, but they actually do belong to actual human individuals. For example, we can hear the reproduction of a public speech by Fidel Castro in “Quadraturen IIIc”, or similarly, a voice recording of Sigmund Freud in “Quadraturen IIIg”. In this regard, the piano in Ablinger's music does not merely evoke the false presence of a ghost; it assumes the characteristics of a so-called haunted object. The supposed ghost seemingly resides right within the

⁷⁰ See Chapter 1.2 & 1.3.

instrument and consequently attains the semblance of an artificial consciousness that is attached to that specific object. The overall coherency of the piano's speech and its capability to form virtually intelligible sentences further reinforce this impression. Occasionally, the spoken contents of the original voice recordings can also influence the overall effect of the piece. For instance, in "Quadraturen III", we hear the recorded message of a wrathful Arnold Schoenberg who fiercely threatens his addressee⁷¹ for his inconsiderate actions. The retaliatory attitude of the artificial voice considerably bolsters the object's threatening status and brings an added uncanny element to the piece⁷².

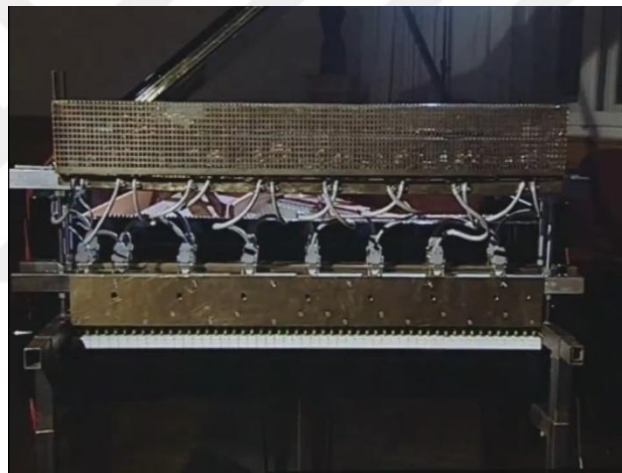


Figure 12: The automated player piano in "Quadraturen III" (ear, 2018).

Considering the year that "Quadraturen" was composed, a machine that reproduces the human voice cannot necessarily be regarded as an uncanny technological novelty by itself. Devices such as record players, televisions, or gramophones long existed

⁷¹ In the recording, Arnold Schoenberg accuses record producer Ross Russell for publishing "Ode to Napoleon" with a female singer's voice despite Schoenberg's protests (*VR48: Brief, Los Angeles*, n.d.).

⁷² It could be important to note that the message can almost only be understood with the aid of an accompanying text. Although the artificial voice is relatively lifelike, it is still far from being intelligible by itself.

before Ablinger's work came into being. However, a speaking piano nonetheless elicits an exceptionally strong uncanny effect which we normally would not ascribe to any of the other aforementioned technologies. This is firstly due to the fact that the piano belongs to a centuries-long musical tradition that has come to define the instrument's idiomatic capabilities and function. Therefore, such a radical transgression of the piano's familiar sound palette can expectedly result in an alienating experience, especially considering the fact that in *Quadraturen*, these new sounds are achieved without the agency of a human performer⁷³. However, what is perhaps most noteworthy about the usage of a piano is that the instrument makes the physical means of sound production immediately visible to the viewer. Every single bit of sound that constitutes the total vocal impression is ultimately produced by the piano's own 88 keys, without the use of any additional sound devices, electronics, or extended techniques. The spectator can therefore simultaneously see and hear how the piano produces its sounds. In this regard, one would expect that openly witnessing the work's mechanical procedure would consequently demystify its ghostly illusion; but on the contrary, it causes an even further divide between our expectations and the physical reality. Our ears can recognize the timbre of the piano and our eyes can see the keys that are being pressed; but nonetheless, the sounding result is so disconnected from our conventional understanding of the instrument that we eventually arrive at an even deeper disbelief. It is perhaps this astonishing coexistence of material reproduction and impalpable ghostliness that is what primarily causes the uncanny effect. On one hand, we intellectually acknowledge that the player piano is indeed an entirely inorganic, non-human construct; yet on the other, its convincing human-like

⁷³ One could say that this defamiliarization can also be experienced in regard to the player piano's appearance. The "auto-piano player" device that is attached onto the piano brings a highly mechanical look to the instrument, which further challenges its historical signification (see Fig. 12).

voice actively challenges our perception. Meanwhile, the material reproducibility of language as an exclusively human element additionally calls forth an existential conflict which is referred to as “human-robot uniqueness” in the relevant uncanny valley literature⁷⁴ (MacDorman & Entezari, 2015). Ultimately, both the philosophical and the perceptual aspects of the experience stem from a liminality between the human and the machine. The player piano constantly seems to stretch out of its own material boundaries, but just as we think we can identify its voice, the words disappear once more among the rapid succession of notes.

In his description of phonorealism, Ablinger speaks of a “border-zone between abstract musical structure and the sudden shift into recognition” (*Phonorealism*, 2005). Here he underlines the transitory nature of the “phonorealistic” experience; in one moment we are only hearing tone clusters on the piano, while in another we suddenly catch onto an intelligible word or a phrase⁷⁵. Our perception is thus constantly oscillating between the musical and the linguistic planes, even though both planes exist simultaneously within any given moment (Barrett, 2009). In this regard, one could say that the very idea behind “Quadraturen” is based on perceptual ambiguity. The listener continuously tries to categorize what they are hearing on the piano either as a voice or as a piece of music, while at the same time struggling to understand what the voice is saying. The in-betweenness of the piano’s speech concurrently refers to multiple realities: from a semantic point of view, it designates the difference between music and language; while from an acoustic perspective, it highlights the borderline between the piano’s instrumental sound and its “voice”. In

⁷⁴ See Chapter 2.2.

⁷⁵ This aspect of the work poses a similarity with Rosenberger’s “Quartet - Bodies in Performance”. Both pieces offer an unsteady experience in the sense that the viewer or listener is continuously brought in and out of the uncanny dimension.

relation to the uncanny valley concept, these dualities can accordingly be associated with the “perceptual tension” theory (Moore, 2012; MacDorman & Entezari, 2015). The piano’s human-like voice poses an uncanny contrast with its familiar instrumental timbre and physical appearance. Likewise, the mechanical sound production ascribes a distorted, robotic quality to its speech. The vocal timbre therefore amplifies the category confusion that is caused by the perceptual tension. Angela Tinwell accordingly asserts that not being able to associate a voice with its original source can cause an uncanny effect, which is significantly dependent on pitch and intonation (Tinwell, 2015). The player piano in “Quadraturen” produces a highly mechanical yet still a remarkably human-like speech, causing it to fall down into the uncanny valley. In this regard, Ablinger perfectly manages to recreate the metaphor of the “ghost in the machine”⁷⁶ with his creation of the speaking piano.

3.2.7. Persona in George E. Lewis’s “Voyager” (1986 - Ongoing)

“Voyager” is an interactive “virtual improvising orchestra” which human performers can create music with in real time (Lewis, 2000). The machine listens to the performer’s musical output and takes that information to “guide an automatic composition (or, if you will, improvisation) program that generates both complex responses to the musician’s playing and independent behavior that arises from its own internal processes” (Lewis, 2000:33). The “Voyager” performs with 64 “single-voice MIDI-controlled ‘players’” (Lewis, 2000:34), playing a wide range of virtual sounds that replicate European, African, American, Asian, and Middle Eastern instruments (Steinbeck, 2018). Other than the fact that it is powered by a computer, there is not much of a difference that separates the “Voyager” from a human improviser. The

⁷⁶ “Ghost in the machine” is how philosopher Gilbert Ryle refers to the Cartesian mind-body dualism (Ryle, 1949/1951).

program can choose to respond to other musicians' ideas or to ignore it, and can even compose music by itself without any external input. Perhaps even more importantly, the "Voyager" has a personality; an inbuilt aesthetic approach towards music making that was essentially coded in by its creator George Lewis. Therefore, when a musician is performing together with the "Voyager", one cannot speak of a hierarchical relationship that is set by the mere condition of being human. The program can formulate intricate musical ideas and be a functioning member of the ensemble as "convincingly" as any other performer. In return, this neutralization of the human factor, or in other words, the fact that the "Voyager" can "pass" as a human being, brings an uncanny element to the piece. Existential issues that profoundly relate to the uncanny concept, such as humankind's reproducibility, replaceability, and material nature, are all resurfaced and explored through George Lewis's creation.

In his article "Too Many Notes: Complexity and Culture in Voyager", Lewis quotes Yusef Lateef on the subject of the improviser's personality: "The sound of the improvisation seems to tell us what kind of person is improvising. We feel that we can hear character or personality in the way the musician improvises" (as cited in Lewis, 2000:37). An improviser actively makes stylistic and social choices; they choose to listen, ignore, complement, oppose, perhaps display virtuosic skill, or decide to show restraint. Their muscle memories, musical ideas, and overall sound vocabulary are all indicative of their personal and cultural identities. Lewis accordingly ascribes a great importance to the "Voyager's" identity and writes that "Part of the task of constructing *Voyager* consisted of providing the program with its 'own sound'" (Lewis, 2000:37). In this regard, the "Voyager" is much more than just a technological gimmick; it represents the cultural and aesthetic values of its creator. For example, Lewis draws a parallel between the "Voyager's" tendency to combine

“dense, rapid accretions of sonic information with sudden changes in mood” (Lewis, 2000:36) with the Africobra artists’ “jam-packed” aesthetics and situates this approach against Eurocentric ideals (Lewis, 2000). Similarly, he states that the “Voyager” models the Javanese gamelan ensemble in regard to how a large number of gamelan players can perform altogether without the need of a central authority⁷⁷ (Lewis, 2000). These aspects which define the program’s distinct persona are essential to Lewis’s core intention with the work (Lewis, 2000:38):

Voyager is not asking whether machines exhibit personality or identity, but how personalities and identities become articulated through sonic behavior. Instead of asking about the value placed (by whom?) on artworks made by computers, *Voyager* continually refers to human expression. Rather than asking if computers can be creative and intelligent – those qualities, again, that we seek in our mates, or at least in a good blind date – *Voyager* asks us where our own creativity and intelligence might lie – not “How do we create intelligence?” but “How do we find it?” Ultimately, the subject of *Voyager* is not technology or computers at all, but musicality itself.

“Voyager” is therefore not meant as a circus attraction where a machine gets to display its talents; rather, it turns its mirror towards us humans instead. The aspects of our own humanness are hinted through the “Voyager’s” improvisational tendencies and ultimately, its individual persona. Within this context, one would first have to identify what qualities does “human-likeness” entail before claiming that a machine possesses a human-like intelligence or personality. Lewis’s “Voyager” tackles these problems by leveling the playing field among the human and the machines; the work

⁷⁷ The “Voyager” itself can be regarded as an improvising ensemble, as each “single-voice MIDI-controlled ‘player’” functions asynchronously (Lewis, 2000).

allows a mutual dialogue where both parties can learn from each other on an equal basis.

Humanity's fear against the mechanical *doppelgänger* has widely been assessed in conjunction with the uncanny valley concept. One can find relevant issues explored in uncanny valley studies under categories such as “religious fundamentalism”, “negative attitudes towards robots”, and “human-robot uniqueness”⁷⁸ (MacDorman & Entezari, 2015). Likewise, George Lewis also openly acknowledges the uncanny potential behind his work and accordingly situates the “Voyager” within a historical context that pertains to the uncanny (CTM FESTIVAL, 2018). In a number of his articles and talks, Lewis makes references to the prevalent technophobic skepticism towards creative machines and conversely, the sanctity that is ascribed to the human genius. For instance, in his article “Mobilitas Animi: Improvising Technologies, Intending Chance”, Lewis shares a personal anecdote from when he played an audio example to his class of undergraduate students; a music piece that was composed in the style of Mozart by a computer program (Lewis, 2007:112):

Well, it turned out that (surprise), the music on the CD was made, not by Mozart, but by a computer program written by the composer David Cope, a pioneer in the deployment of artificial intelligence within the field of music theory. Suddenly, talk of sacrilege was in the air, as sounds that just a few moments earlier had been part of the very definition of humanity's highest ideals were suddenly transformed into a threatening Frankenstein. Mozart (without quotes) turned into ‘Mozart’, a character in a morality play about human intelligence.

⁷⁸ See Chapter 2.2.1.

The uneasiness that is felt towards creative machines is reflective of a will for a hierarchical structure; it shakes the humanity's conviction in their sapient status within nature. For this reason, Lewis asserts that the idea of composing machines is regularly met with adverse reactions (CTM FESTIVAL, 2018):

It seemed once again to many that there is just something wrong with the notion of computers as improvisers. There is something special about improvisation; something essential, something fundamental to the human spirit; and you really couldn't or you really shouldn't approach that with machines.

During the same talk where Lewis makes the above statement, he presents a compilation of examples from history and literature that depict the social and functional positioning of robots within society⁷⁹. He refers to Karel Čapek's famous play "R.U.R."⁸⁰ (1920) in which a working class of robots revolt against and destroy humanity, emphasizing how Čapek saw a danger in robots being able to pass as human beings. He then follows this idea with a quotation from sociologist Erving Goffman: "The more closely the imposter's performance approximates to the real thing, the more intensely we may be threatened" (Goffman, 1956; CTM FESTIVAL, 2018). Ultimately, he segues from Goffman's quotation to Masahiro Mori's uncanny valley theory and suggests that the concept which Mori formulated in regard to human-like appearances can be assessed from a sonic perspective within the context of improvising machines. Thus we see that Lewis himself conceives a possible

⁷⁹ Lewis holds the view that the "human and non-human" classification can fundamentally be regarded as a political issue. Within this context, he draws a historical parallel between the *otherness* that is ascribed to machines and to the African American people in the US. As an example, he refers to how Barack Obama's rise to presidency was perceived as an uncanny occurrence by certain partisans, as they viewed Obama as an imposter occupying a white man's position (CTM FESTIVAL, 2018).

⁸⁰ Rossum's Universal Robots

relationship between the “Voyager” and the uncanny valley concept. His discussion on the uneasiness evoked by creative machines, the object’s power of agency⁸¹, and the role of human-likeness in human-machine interactions appositely highlights the “Voyager’s” contextual link to the uncanny valley phenomenon. Lewis’s deliberate intent in removing the social and categorizational boundaries between human and machines accordingly accentuates this correlation.

Lewis does not make an argument for the uncanniness of the “Voyager”; nor does he claim that he created the program with the purpose of eliciting an uncanny effect. It is rather up to the listener and the performer how the “Voyager” can be experienced from a human perspective. One could readily acknowledge the program as a musician and agree to hear its music, or maintain the notion that a machine cannot offer an authentic musical experience. In regard to this conflict, Lewis does not concern himself with defending the “Voyager’s” computational complexity; rather, his interest lies in the fact that the “Voyager” reflects a unique persona just like any other improviser. The “Voyager’s” supposed personality and intelligence is sculpted by the real-time choices it makes and for that reason, the effort to measure its human-likeness becomes inconsequential. In this regard, the “Voyager”, who does not possess a physical body, makes its presence felt solely through its sonic behavior.

Thus once again, we experience the intangible presence of a so-called human-like

⁸¹ On the subject of an object’s agency, Lewis writes that the idea of giving the “Voyager” a unique voice can be viewed “in tandem with a kind of technology-mediated animism” (Lewis, 2000:37). He further elaborates on this notion by referring to an account from Francis Bebey: “Further, the trope of musical performance on an instrument as communication between two subject intelligences is exemplified by Francis Bebey’s description of an incident wherein an accomplished African musician, after trying an instrument briefly, handed it back to its owner with the remark that he had no way of communicating with ‘someone who did not speak the same language’ as he did. Bebey, in general discussion of African music, further maintains that in a number of African musical traditions a musical instrument ‘is often regarded as a human being.’” (Lewis, 2000:37).

being asserting its presence through sound, which pertinently allows for an uncanny reading of the piece.

3.2.8. Crossmodal Mismatch in Steven Takasugi's "Sideshow" (2009-15)⁸²

"Sideshow" is an electroacoustic piece written for an octet and live electronics. The program notes describe the piece as follows: "Based on the dark sideshows of Coney Island's amusement parks in the early part of the 20th century, Sideshow is a meditation on virtuosity, freak shows, entertainment, spectacle, business, and the sacrifices one makes to survive in the world" (NO HAY BANDA, 2019). The piece can be regarded as a form of music theatre where the instrumentalists put on a "sideshow" for the audience; a grotesque spectacle that is meant to be more disturbing than entertaining in accordance with Steven Takasugi's artistic intentions. The work is replete with uncanny imagery; virtually every trope that has been discussed in this chapter so far in relation to the uncanny valley phenomenon can also be found in "Sideshow". The performers' bodily appearances, gestures, facial expressions, speech, and voices are all adjusted or manipulated according to a customary uncanny aesthetic. For Takasugi, these elements are all there to serve one purpose, which is to mislead the audience by creating perceptual and crossmodal mismatch. "Sideshow" is in overall based on deception⁸³; it intends to overwhelm the spectator by constantly presenting them two versions of the same phenomena. Instruments and voices are regularly doubled by the pre-recorded playback and the performers once again operate within a liminal zone between the human and non-human. These uncanny doublings continuously force the listener to make decisions among the real and the fictional,

⁸² This analysis is based on NO HAY BANDA's performance of the piece (NO HAY BANDA, 2019).

⁸³ Takasugi states that "Sideshow" is accurately described by his friend Kai Johannes Polzhofer as "a machine for deception" (CIRMMT, 2019).

thus creating an atmosphere of uncertainty. In this regard, perceptual conflict plays a central role within the piece; the intended discrepancies between the sounds and the visuals aim to confound the viewer and undermine their sense of security. Takasugi accordingly uses the analogy of a “house of mirrors” (CIRMMT, 2019), a place where real images are exaggeratedly distorted for an amusing effect. However, in Takasugi’s work, the degree of this distortion is pushed so far that the anticipated amusement in return gives its place to an unavoidable apprehension. Thus, as Takasugi puts it, the “audience member who has innocently come to watch the show” (CIRMMT, 2019) is unexpectedly pulled out of their comfort zone and placed in a precarious position.

Takasugi’s talk on his work “Sideshow”, which is appositely entitled “A machine for deception: Electro-acoustic composition as sleight of hand”, begins with the following words (CIRMMT, 2019):

Fact or fiction? Actual or virtual? Live or recorded? Honest or deceptive? The mixed media work, especially those that bring together recorded samples of acoustic instruments with their live counterparts, offers the electroacoustic composer a unique opportunity to reflect on today's ambiguous, uncertain, paradoxical, and contradictory world. It is a musical realm where predictive faculties are thwarted, where assumptions are tested, in short, a house of mirrors whose reflections and actualities become confused and exchanged. It is an art of misdirection, sleight of hand, ventriloquism, imposters, and role reversal. It is an art form, a music theater, that is both critical and complicit, offensive and emphatic, concrete and illusive, pragmatic and impossible. This lecture offers insights into these ideas through a work entitled “Sideshow” and how this is achieved via a peculiar take on a basic concept of musical orchestration. I call it “a strange doubling”.

The concept of doubling, in conjunction with the *doppelgänger* motif, is assessed from several angles in Takasugi's work. The composer takes the initial idea from the conventional orchestration technique of "doubling", where an instrument part is duplicated by another instrument either in unison or octaves⁸⁴. In "Sideshow", sonic doubling denotes a more obscured relationship between the amplified acoustic instruments and the pre-recorded electronic playback. Throughout the entire work, the performative gestures of the musicians are matched by pertinent audio samples in the playback. These electroacoustic pairings consequently result in blatant discrepancies between the aural and the visual stimuli and often times create a confusion regarding the authentic source of the sound. Similarly, in many instances, Takasugi uses digitally manipulated non-instrumental sounds to match the performers' gestures, therefore adding an unnatural sonic layering to the performance. This perceptual split is further outlined in sections where a performer simply mimics a gesture without producing a sound, but we still hear its electronic counterpart played in the recording. Takasugi's explanation regarding these doubling processes forms a notable connection with the uncanny concept (CIRMMT, 2019):

If live music is music performed by live musicians, here and now, in the flesh; then recorded music, logically, might well be called "dead music". "Live" and "dead", themselves doubled realms. So in this house of mirrors with its many doublings, the living and the dead are allowed to mingle. But these extremely fast algorithms applied to these recorded samples, the dead might become extraordinarily facile; might be able to mimic the live, even surpass them. And who is who becomes at times nearly impossible to ascertain. In fact, during

⁸⁴ Takasugi describes it as "the same, but slightly different" (CIRMMT, 2019).

rehearsals, neighboring musicians would swear that the sound on the pre-recorded playback was being reproduced by someone in the room.

Takasugi's ascription of the living and the dead, together with the inseparability of these two realms, echo a recurring discussion within the uncanny literature. In Jentschian terms, the psychical uncertainty that arises from the "doubt as to whether an apparently living being really is animate and, conversely, doubt as to whether a lifeless object may not in fact be animate" (Jentsch, 1906/2008:8) is explored in "Sideshow" through sonic means. Likewise, Mori's uncanny valley theory compares the uncanny object to the "living dead" (Mori, 1970/2012), a notion which recurs in the relevant scientific literature as the "mortality salience hypothesis" (MacDorman & Ishiguro, 2006). Takasugi's work therefore mirrors these concepts by superimposing "live" acoustic sounds and "dead" recordings within the same body.

In "Sideshow", the musicians are in general made to act like malfunctioning animatronic puppets; their anomalous appearances, gestures, facial expressions, and speech behavior continuously oscillate between the real and the artificial. Among these elements, the asynchronous speech produced by the electronic playback constitutes an especially disturbing effect, as it uncannily conjoins the "dead" recorded sounds together with the actions of the "live" performers. One particular scene in this regard can be taken as a clear example to how Takasugi implements the aforementioned elements in "Sideshow": during Movement IV, there arrives a section where the whole ensemble (except the clarinetist) suddenly locks their gaze on the saxophonist, who out of nowhere falls into a fit of manic laughter. The saxophonist's expression constantly switches back and forth between a lunatic glee and fearful shock, creating the impression that the laughter is in fact being forced upon her (see Fig. 13). Her delirious behavior is doubled by digitally manipulated cackling sounds

in the electronics, which pose a bizarre perceptual mismatch with her facial mimicry. The ensemble's gaze is then all of a sudden pointed towards the cellist, who starts displaying extremely disfigured facial expressions, as if she is struggling to maintain control over her own body. Meanwhile, the maniacal laughing track from the previous instance still persists, even though the cellist is not mimicking any laughter. These instantaneous switches among the ensemble members occur a few more times, until there arrives a new section where the whole ensemble freezes in a static, frowning expression, staring directly at the audience. Over the period of a minute, the scowl extremely slowly transforms into a broad, toothy grin with wide open eyes (see Fig. 13). What is especially noteworthy about this grin is that the musicians' exposed teeth are in fact artificial; we realize that during the previous section, the ensemble members have secretly placed cartoonish paper drawings in their mouths that somewhat resemble prosthetic teeth. Since this cosmetic change occurs covertly with a sleight of hand, the viewer does not expect to suddenly see such an unnatural appearance, which further amplifies the uncanny effect of the moment. Finally, with a loud percussive hit from the recorded playback, the entire ensemble abruptly bends forward, leaving the percussionist to be the only one standing. Similar to the previous instances, the percussionist also mimics grotesque facial expressions as if he is suffering from pain, while from the electronics we hear gurgling and grunting noises that sound like the strangling of an animal.

The scene that is described above can be assessed in various ways in relation to the uncanny valley phenomenon. The saxophonist's ambivalent, exaggerated facial expressions send mixed signals to the viewer, potentially resulting in an alarming perceptual threat; while the ensemble's overall writhing movements insinuate that they are being puppeteered by an external force against their will (Tinwell, 2015).

Likewise, the gradual facial transformation towards a grin appositely recapitulates Mori's example of the robot that was adjusted to deliver an unnaturally slow human smile⁸⁵ (Mori, 1970/2012). Furthermore, the fake teeth displayed in the performers' mouths cause an inconsistency among the realism of the visual elements, therefore eliciting a perceptual tension in the performers' appearances (Moore, 2012; MacDorman & Entezari, 2015). Lastly, the accompanying vocal playback sounds such as robotic laughter and inhuman gurgling noises considerably distort the sonic impression of the performers. Virtually all of these effects are caused or enhanced by a crossmodal mismatch between the aural and visual stimuli. The pairing of the human performers with non-human vocal sounds produces a strikingly uncanny discrepancy that is also documented in the relevant uncanny valley literature. For example, in their paper entitled "A Mismatch in the Human Realism of Face and Voice Produces an Uncanny Valley", Mitchell et al. demonstrate that a human figure matched with a synthetic voice evokes a notably eerie effect for the observer⁸⁶ (Mitchell et al., 2011). Similarly, in concordance with Jentsch's reference to epileptic seizures, Angela Tinwell writes (Tinwell, 2015:64):

The viewer may take a defensive stance against those who present (...) sudden transitory states of fitting as it may seem that "automated or mechanical processes" were at work behind the individual (p. 226). The uncontrolled babbling effect of asynchronous speech in a character may raise the possibility

⁸⁵ See Chapter 2.2.

⁸⁶ The study compares four possible combinations that are listed as: *human figure–human voice*, *human figure–synthetic voice*, *robot figure–synthetic voice*, *robot figure–human voice*. Among these conditions, *human figure–synthetic voice* and *robot figure–human voice* were rated significantly higher on eeriness, with the *human figure–synthetic voice* condition being rated the highest (Mitchell et al., 2011).

that the character is no longer in control of their body and mind hence presenting a possible threat to the viewer.

Takasugi makes ample use of such perceptual inconsistencies all throughout the piece. “I propose a music of speculation, a music of uncertainty” (CIRMMT, 2019) he says, and situates the idea of sonic doubling at the center of his work. The grotesque and ambiguous elements in “Sideshow” are first and foremost meant to unsettle the audience. In this regard, Takasugi divides the concert hall into two sections: the spectators, who are the observers, and the performers, who are the observed. However, with yet another uncanny form of doubling, Takasugi subverts this relationship through the performers’ incessant, ominous gaze (CIRMMT, 2019):

Sideshow attempts to address, create this discomfort, though implicitly, subtly, subcutaneously if you will, and so the very relationship of performer and audience is by necessity the larger target of this mirror, doubling metaphor. It is nearly inescapable for the staged musicians to avoid a staring contest with the seated audience members. I only instruct the performers that if this becomes the case, they must win at all cost.

Thus it becomes clear that the uncanny is an essential ingredient in “Sideshow”. The perceptual disturbances, which are almost always facilitated by the peculiar combinations of performance and sounds, provide an equivocal experience for the audience. In consequence, Takasugi’s “house of mirrors” manages to topple the expectations of its audience through doubling and distorting both sonic and visual images.



Figure 13: On the left, the saxophonist is deliriously laughing with a mixture of extreme joy and pain. On the right, a close-up on the ensemble exposing their fake teeth with a psychopathic grin (NO HAY BANDA, 2019).

3.2.9. Fiction in Natacha Diels' "Uncanny Valley" (2011)⁸⁷

"Uncanny Valley" is a monodrama written for ensemble and electronics. Natacha Diels describes the work as follows (*Uncanny Valley [a monodrama]*, n.d.):

Uncanny Valley explores the region where robotic human replicas begin to emulate human characteristics too closely, causing revulsion in observers. The monodrama investigates this sometimes-uncomfortable line between automaton and human through the legend of Francine, Descartes' mechanical daughter. The story pursues the discovery, revulsion, and eventual destruction of this mechanical being; and explores the conflict between machine and human through the interwoven dialogues of Francine and narrator.

The mythical story of Francine was originally told in a work entitled "Mélanges d'histoire et de littérature" (1699) by Vigneul-Marville, possibly as an attempt to

⁸⁷ "Uncanny Valley" includes the collaboration of Jessie Marino, Andrew Greenwald, David Broome, and Bryan Jacobs, who wrote the interludes of the music, and Dominique Ahkong who wrote the text. The performance also contains a live video projection done by Dan Iglesia and an animation by Kakyoung Lee (*Uncanny Valley [a monodrama]*, n.d.).

repair Descartes' moral reputation after his death⁸⁸ (Kang, 2016). The story has seen countless reiterations and changes throughout the centuries, with Gaby Wood's version in her book "Living Dolls: A Magical History of the Quest for Mechanical Life" (2002) being one of the most popular examples. According to Wood's rendition, the story begins with Descartes going on a sea journey upon being summoned by the Queen of Sweden. One day, the sailors on the ship decide to sneak into Descartes' quarters and stumble upon a mysterious box (as cited in Kang, 2016:657):

As soon as they opened it, they jumped back in horror: inside the box was a doll – a living doll, they thought, which moved and behaved exactly like a human being. Descartes, it transpired, had constructed the android himself, out of pieces of metal and clockwork (...) When the ship's captain was shown the moving marvel, he was convinced, in his shock, that it was some instrument of dark magic, responsible for the weather that had hampered their journey. On the captain's orders, Descartes' "daughter" was thrown overboard.

The story is reminiscent of a classic Gothic tale; a ship in the midst of a storm, a mysterious mechanical *doppelgänger*, and the association of dark magic with a technological invention. Natacha Diels' "Uncanny Valley" is based on a poetic reinterpretation of this story written by Dominique Ahkong, whose version also introduces several new additions to the myth. Most notably, Ahkong emphasizes Francine's bodily features with an uncanny undertone, an aspect that is not mentioned in the original story (Diels, 2011):

⁸⁸ The story replaces Descartes' illegitimate daughter Francine with a mechanical doll with the same name, thus intending to erase the actual daughter's existence from history (Kang, 2016).

(...)

So arises the girl from slumber,

limb upon limb unfolding.

The head unrolls and lifts.

The shoulders untwist and open.

The knees pull back beneath the frock---

so she rises and stands.

(...)

The shoulders untwist

and shudder

The knees

fevered knees jerk

(...)

Phantasmal girl! Daughter of the storm!

resounds the skipper's roar---

Overboard, overboard!

So the convulsing girl is dragged

heaved overboard, overboard,

into the shuddering sea.

Ahkong's retelling of the tale with its deliberate focus on corporeal imagery reflects an aesthetic that pertains to both the uncanny and the uncanny valley concepts. Diels takes this fictional text as her starting point and implements various compositional strategies onto it as a means to explore Francine's ambivalent identity. In this regard, the textual narrative constitutes the main uncanny factor in the piece, while the

composer's musical assessment accordingly highlights the story's subtextual elements.

Natacha Diels' works are strongly influenced by the uncanny concept. In her article "Art and the Uncanny: Tapping the Potential", Diels makes direct references to Jentsch, Freud, and Mori's essays, stating that her pieces "Nystagmus", "Uncanny Valley", "Nightmare for JACK (a ballet)", and "Second Nightmare, for KIKU" were all written in relation to an uncanny aesthetic (Diels, 2014). "Of primary interest to me are the niches created by the blurry dividing lines, by the unlikely merging of certain artistic practices that elicit feelings of discomfort and uncertainty in the viewer – an exploration of the uncanny" she writes, and further adds (Diels, 2014:75):

(...) the usefulness of the uncanny as a positive artistic tool is apparent: one aspect of the tremendous appeal of great art is its ability to temporarily suspend and exploit one's sense of reality within visual, aural and written contexts.

Diels' mentioning of written contexts alongside visual and aural art forms is congruent with her narrative approach in "Uncanny Valley". As a monodrama, the work's musical and visual aspects are directly informed by the underlying fictional elements of the story. Diels asserts that the piece is centered on two main characters: Francine, who is performed by the vocalist, and the narrator, who is actually a pre-recorded voice (Diels, 2014:76):

My intent was to obscure the personality of the narrator and eventually combine his voice with Francine's, leaving the audience incapable of visualizing a personality behind the omnipresent voice. I used digital audio processing techniques to confuse the gender, location and actual/robotic traits of the narrator's voice. Throughout the work, Francine's and the narrator's pitch

material and effect grow progressively more similar, ultimately combining at the climax of the piece.

Diels creates an emphasis on Francine's ambiguous nature by pairing her female voice with a male sounding counterpart, thus accentuating her inhuman qualities. A similar doubling also occurs among Francine and the ensemble, notably during the postlude by Bryan Jacobs where the close pitch intervals in the music cause a dissonant beating with Francine's voice, resulting in a conspicuously robotic vocal texture. In consequence, Francine's helpless wailings as she is being thrown off the ship evoke a contrasting sentiment; on one hand, we want to sympathize with her plight at the hands of the cruel sailors, while on the other, her machine-like voice creates an alienating distance between the character and the audience. In regard to Francine's dehumanized singing, Diels writes: "Francine's part, composed primarily of guttural and sibilant sounds, is reflected and enhanced in both the instrumental parts and the electronic sounds, creating a spectrum of musical material that hopefully provokes feelings of delicious nervousity" (Diels, 2014:76). Hence, Diels positions Francine as a victim and wants to tell her side of the story, but at the same time she deliberately wants to provoke a nervous feeling through her character and accordingly presents her as an uncanny entity.

Diels' exploration of Francine's equivocal identity is also paralleled by the visual aspects of the work. Throughout the performance, an enlarged live image of the vocalist who portrays Francine is projected onto the performance venue's walls. The visuals are heavily filtered and manipulated; the image constantly stutters, slows down, gets duplicated, and often varies in definition. Francine is displayed from several angles at the same time, but we can barely have a clear look on her appearance. Most notably, the live video continuously follows a back and forth

transformation process between a blurry, vague contour and a more discernible, crystallized image. In a way, the visuals somewhat reflect the sailors' perspective in the story; Francine's physical figure very slowly and gradually unravels in front of us, but our perception of her can never be certain. Her image, just like her existential nature, wanders around a liminal zone between the familiar and the strange. Therefore, the ambiguity of Francine's identity, which constitutes the focal point of Diels' music, is also given a visual representation in the piece.

The problem of defining Francine's human identity is further complicated by the end of the piece: the music finishes after Francine is thrown overboard and supposedly killed; however, following the postlude section, we are presented with one last bit of narrative through an animation drawn by Kakyoun Lee. The animation begins with Francine lying down on the ground, embracing her death with a composed smile. Afterwards, we see her soul rise out of her body, leaving her past shell behind. The work ends with the soul walking away into the void, insinuating that somewhere in the unknown, Francine may eventually find peace. Although this belated happy resolution somewhat lifts the uncanny curtain off the piece, it also makes a curious statement regarding Francine's so-called humanness. The character that was presented to us as a mechanical doll since the beginning of the story is revealed to be possessing a soul, which ultimately implies that bearing a "soul" must not be an exclusively human condition. This final commentary underlines the sailors' fundamental mistake, suggesting through a twisted Cartesian perspective that there are no essential differences between the human and the machine. Therefore, the work sets out to challenge our possible assumptions regarding human and non-human categorizations with a conclusive remark on Francine's fate in the story.

Diels' "Uncanny Valley" utilizes both aural and visual elements to distort the audience's perception; but more importantly, it does so in relation to the philosophical questions that are raised through its fictional narrative. It is of course not coincidental that the original tale revolves around René Descartes and her daughter, as the philosopher was famous for suggesting that human and animal bodies are no different than machines, with the crucial difference being that humans possess a "rational soul" (Descartes, 2006). In this regard, "Uncanny Valley's" narrative can primarily be assessed in conjunction with subjective attitudinal factors such as "religious fundamentalism" and "human-robot uniqueness", which profoundly relate to the uncanny valley phenomenon (MacDorman & Entezari, 2015). By giving Francine a "soul" and further blurring her identity through musical and visual means, "Uncanny Valley" aims to accentuate an unsettling zone on a vague spectrum of human-likeness. Diels' conscious implementation of uncanny aesthetics in relation to Jentsch, Freud, and Mori's theories therefore brings a new perspective to Francine's mythical story.

CONCLUSION

The concept of the uncanny followed a long historical trajectory starting from the modern era up until the contemporary period. Chapter I discussed how the Scientific Revolution and the Enlightenment paved way to a new intellectual understanding that favored rationality over superstitious thought. The cultural assimilation of the irrational in return gave birth to the uncanny and its reflections within modern art and literature. The concept was notably put forward by Ernst Jentsch, whose theories on anthropomorphism, human-likeness, and intellectual uncertainty still prove to be highly relevant today. On the other hand, it was Sigmund Freud who earned the term its popularity, as he was the one who gave the concept its “strangely familiar” thus liminal status. As we arrive to the year 1970 when Mori wrote his influential essay “The Uncanny Valley”, we realize that every aspect that made Mori’s theory pertinent to our contemporary culture has in fact had a historical counterpart within the uncanny concept. Through Hoffman’s “Sand-Man” and Shelley’s “Frankenstein” we faced the underlying threats that human-like creations harbor, while Poe’s story appositely highlighted the corporeal aspect of the uncanny which Mori also discusses in relation to lifelike prosthetics. Likewise, Cowell’s “Banshee” and Browning’s “Dracula” showed how the effect can be applied to the aural domain through disembodied vocalized sounds and crossmodal discrepancies. The Freudian fear of being replaced by the “other”, the *doppelgänger* motif, repressed death anxieties, and

the psychological perspective on one's loss of physical and mental bodily integrity have all accordingly manifested themselves within the uncanny valley literature. Therefore, if we wish to assess the uncanny valley theory in its full historical context, then neither its perceptual factors nor its philosophical implications can be held separately from the uncanny concept. The concept of the uncanny deals with liminal realities on a larger scope, while the uncanny valley theory exclusively focuses on the bordering zone between the human and non-human. Ultimately, both ideas are concerned with the same particular affect and thus refer to a parallel experience. The aesthetic imprints of this experience eventually accumulated in what we can broadly label as "uncanny art", whose artifacts can also be traced within contemporary music, as this thesis aimed to demonstrate.

The contemporary composer who wishes to delve into the uncanny valley phenomenon is faced with two distinct strands of literature; on one hand, there is the plethora of theoretical writings on subjects ranging from the human-machine relationship to the century-old uncanny concept, while on the other, there are the relatively younger and ever-increasingly fruitful scientific studies from fields such as cognitive science and android research. This thesis undertook a conjoint perspective in regard to both of these terrains and attempted to distill a historical outlook that situates the uncanny valley as an integral aspect of certain contemporary music works. In order to demonstrate how the uncanny valley effect can operate through music, the phenomenon's causal factors were first divided into seven categories, being Bodily Appearance, Bodily Motion (Gesture, Facial Expression, Corporeality), Speech, Voice, Persona, Crossmodal Mismatch, and Fiction. These categories were then individually matched with pertinent contemporary music examples and their emotional and contextual functions within those works were examined. The analysis

intended to reveal that the particular affect that these pieces might either deliberately or unintentionally evoke and the means of producing this affect in fact belong to an established background in theoretical and scientific studies.

The compositional works that are referenced in this study all contain defining elements that point towards a customary uncanny aesthetic. In this regard, the vast literature on the uncanny and uncanny valley concepts may grant us a deeper understanding on how such works can be perceived in relation to a relevant historical context. Hopefully, this study will offer a suitable perspective in regard to the place of the uncanny valley in contemporary music and perhaps even suggest possible artistic strategies for composers who wish to implement the effect in their own music.

References

- Aldiss, B.W. (1995). *The detached retina: Aspects of SF and Fantasy* (1st ed.). New York, USA: Syracuse University Press.
- Alexander Schubert. (2012, August 1). *Alexander Schubert – Point Ones (Nadar Ensemble)* [Video]. Retrieved from <https://www.youtube.com/watch?v=CN-rIluyNbY>
- Alice in Wonderland*. (n.d.). Retrieved from <https://www.boosey.com/pages/opera/moredetails?musicid=57667>
- Almedia, D. (2010). The Dismembered Body: Poe's "The Man That Was Used Up" and Cindy Sherman's Prosthetic Compositions. *The Edgar Allan Poe Review*, 11(1), 163-173. Retrieved from <https://www.jstor.org/stable/41506398>
- Andersen, H., & Hepburn, B. (2015). Scientific Method. In E.N. Zalta (Ed.), *The Stanford Encyclopedia of Philosophy*. Retrieved from <https://plato.stanford.edu/entries/scientific-method/>
- Barrett, G.D. (2009). Between Noise and Language: The Sound Installations and Music of Peter Ablinger. *Source Mosaic: An Interdisciplinary Critical Journal*, 42(4), 147-164. Retrieved from <https://www.jstor.org/stable/44030532>
- Bearn, G.C.F. (1993). Wittgenstein and the Uncanny. *Soundings: An Interdisciplinary Journal*, 76(1), 29-58. Retrieved from <https://www.jstor.org/stable/41178618>
- Beuka, R.A. (2002). The Jacksonian Man of Parts: Dismemberment, Manhood, and Race in "The Man That Was Used Up". *The Edgar Allen Poe Review*, 3(1), 27-44. Retrieved from <https://www.jstor.org/stable/41506121>
- Binfield, K. (2004). *Writings of the Luddites*. Baltimore, USA: John Hopkins University Press.
- Britannica, T.E.o.E. (2015). *Gothic novel*. Encyclopædia Britannica. Retrieved from <https://www.britannica.com/art/Gothic-novel>

- Britannica, T.E.o.E. (2020). *Banshee*. Encyclopædia Britannica. Retrieved from <https://www.britannica.com/topic/banshee>
- Brown, S.T. (2008). Machinic Desires: Hans Bellmer's Dolls and the Technological Uncanny in "Ghost in the Shell 2: Innocence". *Mechademia: Second Arc*, 3, 222-253. Retrieved from <https://www.jstor.org/stable/41510912>
- Chattopadhyay, D., MacDorman, K.F. (2016). Familiar faces rendered strange: Why Inconsistent realism drives characters into the uncanny valley. *Journal of Vision*, 16(11), 1-25. doi: 10.1167/16.11.7
- Chin, U. (2007). *Alice in Wonderland*. Boosey & Hawkes MP.
- CIRMMT. (2019, May 21). *Steven Takasugi – A Machine for deception: Electro-acoustic composition as sleight of hand* [Video]. Retrieved from <https://www.youtube.com/watch?v=qxkDKB8ozng>
- Cizmic, M. (2010). Embodied Experimentalism and Henry Cowell's The Banshee. *American Music*, 28(4), 436-458. Retrieved from <https://www.jstor.org/stable/10.5406/americanmusic.28.4.0436>
- Clarke, A.C. (2013). *Profiles of the future: An inquiry into the limits of the possible* (2nd ed., p. 489). Great Britain: The Orion Publishing Group Ltd. (Original work published 1962)
- Clery, E.J. (1995). *The Rise of Supernatural Fiction, 1762-1800* (1st ed.). Cambridge: Cambridge University Press.
- Clery, E.J. (2002). The genesis of "Gothic" fiction. In J.E. Hogle (Ed.), *The Cambridge Companion to Gothic Fiction*, (pp. 21-39). New York, USA: Cambridge University Press.
- Cohn, R. (2004). Uncanny Resemblances: Tonal Signification in the Freudian Age. *Journal of the American Musicological Society*, 57(2), 285-324. Retrieved from <https://www.jstor.org/stable/10.1525/jams.2004.57.2.285>
- Collins, J., Jervis, J. (2008). Introduction. In J. Collins, J. Jervis (Eds.), *Uncanny modernity: Cultural theories, modern anxieties* (pp. 1-9). Houndmills, Basingstoke, Hampshire, NY: Palgrave Macmillan.

- Contemporary Classical. (2015, August 26). *Unsub Chin: Alice in Wonderland 2007 Opera* [Video]. Retrieved from https://www.youtube.com/watch?v=_hXt-BPhRKA
- CTM FESTIVAL. (2018, July 12). *CTM 2018: Why Do We Want Our Computers to Improvise?* [Video]. Retrieved from <https://www.youtube.com/watch?v=wDP8FsJyCaA>
- Descartes, R. (2006). *A Discourse on the Method*, (I. Maclean, Trans.). New York, USA: Oxford University Press Inc.
- Descartes, R. (2008). *Mediations on first philosophy: With selections from the objections and replies* (M. Moriarty, Trans.). New York, USA: Oxford University Press Inc. (Original work published 1641)
- Diels, N. (2011). *Uncanny Valley*. Retrieved from http://natachadiels.com/scores/ScoreExcerpts/Uncanny_excerpts.pdf
- Diels, N. (2014). Art and the Uncanny: Tapping the Potential. *Leonardo Music Journal*, 24, 75-77. Retrieved from <https://www.jstor.org/stable/43832717>
- Dolar, M. (2006). *A Voice and Nothing More*. Cambridge, MA: MIT Press.
- ear. (2018, July 9). *Peter Ablinger* [Video]. Retrieved from <https://www.youtube.com/watch?v=Wpt3lmSFW3k>
- Elferen, I.v. (2012). *Gothic music: The sounds of the uncanny*. Cardiff, UK: University of Wales Press.
- Elmessiri, N. (1994). Burying Eternal Life in Bram Stoker's Dracula: The Sacred in an Age of Reason. *Alif: Journal of Comparative Poetics*, (16), 101-135. Retrieved from <https://www.jstor.org/stable/521768>
- Evans, D. (1996). *An Introductory Dictionary of Lacanian Psychoanalysis*. London and New York: Routledge.
- Field, A. (2013). *Uncanny Valley by Jon Woodward*. Retrieved from <https://therumpus.net/2013/04/uncanny-valley-by-jon-woodward/>

- Fong, T., Nourbakhsh, I., & Dautenhahn, K. (2003). A survey of socially interactive robots. *Robotics and Autonomous Systems*, 42, 143-166. doi: 10.1016/S0921-8890(02)00372-X
- Freer, S. (2012). Magritte: The uncanny sublime. *Literature and Theology*, 27(3), 330-344. Retrieved from <https://www.jstor.org/stable/23926909>
- Freud, S. (1961). *The standard edition of the complete psychological works of Sigmund Freud* (J. Strachey, Trans., pp. 173-179). London, UK: The Hogarth Press. (Original work published 1924)
- Freud, S. (2003). *The Uncanny*. (D. McLintock, Trans.). Penguin Books. (Original work published 1919)
- Gibbs, H.C. (1995). "Komm, geh' mit mir": Schubert's Uncanny "Erlkönig". *19th-Century Music*, 19(2). Retrieved from <https://www.jstor.org/stable/746658>
- Goffman, I. (1956). *The Presentation of Self in Everyday Life*. Edinburgh: University of Edinburgh Social Sciences Research Centre.
- Greenberg, J., Pyszczynski, T., Solomon, S., Simon L., & Breus, M. (1994). Role of Consciousness and Accessibility of Death-Related Thoughts in Mortality Salience Effects. *Journal of Personality and Social Psychology*, 67(4), 627-637. doi: 10.1037//0022-3514.67.4.627
- Guthrie, S.E. (2008). Anthropomorphism. *Encyclopædia Britannica*. Retrieved from <https://www.britannica.com/topic/anthropomorphism>
- Hans Bellmer: List of Works. (n.d.). Retrieved from <https://www.wikiart.org/en/hans-bellmer>
- Harvard University. (2013, July 1). *UNCANNY VALLEY: A Performance by Oni Buchanan & Jon Woodward | Woodberry Poetry Room* [Video]. Retrieved from <https://www.youtube.com/watch?v=luXCFKjeAbA&t=0s>
- Hentschel, F. (2019). Music and the Uncanny in the 19th Century. *Archiv für Musikwissenschaft*, 73, 9-50. doi: 10.31219/osf.io/pjxre

- Ho, C., MacDorman, K.F., & Pramono, Z.A.D. (2008). Human Emotion and the Uncanny Valley: A GLM, MDS, and Isomap Analysis of Robot Video Ratings. *HRI'08*, 169-176.
- Hofree, G., Urgan, B.A., Winkielman, P. & Saygin, A.P. (2015). Observation and imitation of actions performed by humans, androids, and robots: an EMG study. *Frontiers in Human Neuroscience*, 9, doi: 10.3389/fnhum.2015. 00364
- Hogle, J.E. (2002). *The Cambridge Companion to Gothic Fiction*. New York, USA: Cambridge University Press.
- Jentsch, E. (2008). On the Psychology of the Uncanny (R. Sellars, Trans.). *Angelaki* 2(1). (Original work published 1906).
- Jervis, J. (2008). Uncanny Presences. In J. Collins, J. Jervis (Eds.), *Uncanny modernity: Cultural theories, modern anxieties* (pp. 10-50). Houndmills, Basingstoke, Hampshire, NY: Palgrave Macmillan.
- Johnson, C. (1999). Ambient Technologies, Uncanny Signs. *Oxford Literary Review*, 21, 117-134. Retrieved from <https://www.jstor.org/stable/44031026>
- Kanda, T., & Ishiguro, H. (2013). *Human Robot Interaction in Social Robotics*. Boca Raton, London, New York: CRC Press.
- Kang, M. (2016). The Mechanical Daughter of Rene Descartes: The Origin and History of an Intellectual Fable. *Modern Intellectual History*, 14(3), 633-660. doi: 10.1017/s147924431600024x
- Kanga, Z., & Schubert, A. (2016). Flaws in the Body and How We Work with Them: An Interview with Composer Alexander Schubert. *Contemporary Music Review*. Retrieved from <http://dx.doi.org/10.1080/07494467.2016.1258105>
- Kant, I. (1992). *An Answer to the Question: What is Enlightenment?* (T. Humphrey, Trans.). Hackett Publishing. (Original work published 1784)
- Kätsyri, J., Förger, K., Mäkräinen, M., & Takala, T. (2015). A review of empirical evidence on different uncanny valley hypotheses: support for perceptual mismatch as one road to the valley of eeriness. *Frontiers of Psychology*, 6. doi: 10.3389/fpsyg.2015.00390

- Kligerman, E. (2007). *Sites of the uncanny: Paul Celan, specularity and the visual arts*, (Vol. 3), Berlin, Germany: Walter de Gruyter.
- Leopold, D. (2018). Alienation. In E.N. Zalta (Ed.), *The Stanford Encyclopedia of Philosophy*. Retrieved from <https://plato.stanford.edu/archives/fall2018/entries/alienation/>
- Lewis, G.E. (2000). Too Many Notes: Complexity and Culture in Voyager. *Leonardo Music Journal*, 10, 33-39. Retrieved from <https://muse.jhu.edu/article/20320>
- Lewis, G.E. (2007). Mobilitas Animi: Improvising Technologies, Intending Chance. *Parallax*, 13, 108-122. Retrieved from <https://doi.org/10.1080/13534640701682867>
- MacDorman, K.F. (2005). Mortality Salience and the Uncanny Valley. *Proceedings of 2005 5th IEEE-RAS International Conference on Humanoid Robots*. doi: 10.1109/ICHR.2005.1573600
- MacDorman, K.F., & Ishiguro, H. (2006). The uncanny advantage of using androids in cognitive and social science research. *Interaction Studies*, 7(3), 297-337. doi: 10.1075/is.7.3.03mac
- MacDorman, K.F., Green, R.D., Ho, C., & Koch, C.T. (2009). Too real for comfort? Uncanny responses to computer generated faces. *Computers in Human Behavior*, 25, 695-710. doi: 10.1016/j.chb.2008.12.026
- MacDorman, K.F., & Entezari, S.O. (2015). Individual differences predict sensitivity to the uncanny valley. *Interaction Studies*, 16. doi: 10.1075/is.16.2.01mac
- MacDorman, K.F., & Chattopadhyay, D. (2015). Reducing consistency in human realism increases the uncanny valley effect; increasing category uncertainty does not. *Cognition*, 146, 190-205. Retrieved from <https://doi.org/10.1016/j.cognition.2015.09.019>
- MacDorman, K.F. (2019). In the uncanny valley, transportation predicts narrative enjoyment more than empathy, but only for the tragic hero. *Computers in Human Behavior*, 94, 140-153. Retrieved from <https://doi.org/10.1016/j.chb.2019.01.011>

- Masschelein, A. (2011). *The unconcept: The Freudian uncanny in late-twentieth-century theory*. New York, USA: State University of New York Press.
- Merriam-Webster. (n.d.). Jamais vu. In *Merriam-Webster.com medical dictionary*. Retrieved May 3, 2020, from <https://www.merriam-webster.com/medical/jamais%20vu>
- Mitchell, W.J., Szerszen, K.A. Sr., Lu, A.S., Schermerhorn, P.W., Scheutz, M., & MacDorman, K.F. (2011). A Mismatch in the Human Realism of Face and Voice Produces an Uncanny Valley. *i-Perception*, 2, 10-12. Retrieved from <http://dx.doi.org/10.1068/i0415>
- Moore, R.K. (2012). A Bayesian explanation of the ‘Uncanny Valley’ effect and related psychological phenomena. *Scientific Reports*, 2, doi: 10.1038/srep00864
- Moosa, M.M., & Ud-Dean, S.M.M. (2009). Danger Avoidance: An Evolutionary Explanation of Uncanny Valley. *Biological Theory*, 5(1), 12-14. doi: 10.1162/BIOT_a_00016
- Mori, M. (2012). The Uncanny Valley: The Original Essay by Masahiro Mori. (K.F. MacDorman & N. Kageki, Trans.). *IEEE Spectrum*. (Original work published 1970). Retrieved from <https://spectrum.ieee.org/automaton/robotics/humanoids/the-uncanny-valley>
- N.N. (n.d.). Retrieved from <http://www.arsludi.eu/n-n-sulla-morte-dellanarchico-serantini/>
- NO HAY BANDA. (2019, March 6). *Steven Takasugi, Sideshow / NO HAY BANDA* [Video]. Retrieved from <https://www.youtube.com/watch?v=qcoNauoTElg&t=0s>
- Pagden, A. (2013). *The Enlightenment and why it still matters* (1st ed.). Oxford, UK: Oxford University Press.
- Peter Ablinger – *Quadraturen*. (2006). Retrieved from <https://ablinger.mur.at/docu11.html>

- Péteri, L. (2007). Scherzo and the unheimlich: The Construct of Genre and Feeling in the Long 19th Century. *Studia Musicologica*, 48(3/4), 319-333. Retrieved from <https://www.jstor.org/stable/25598301>
- Phonorealism*. (2005). Retrieved from <https://ablinger.mur.at/phonorealism.html>
- Quartet – Bodies in Performance*. (2018). Retrieved from <https://krosenberger.ch/quartet-bodies-performance-1>
- Rank, O. (1971). *The double: A psychoanalytic study* (H. Tucker Jr., Trans. & Ed.). Chapel Hill, North Carolina: The University of North Carolina Press. (Original work published 1914)
- Richardson, K. (2016). Technological Animism: The Uncanny Personhood of Humanoid Machines. *Social Analysis: The International Journal of Anthropology*, 60(1), 110-128. Retrieved from <https://www.jstor.org/stable/24718341>
- Rizzolatti, G., & Craighero, L. (2004). The Mirror-Neuron System. *Annual Review of Neuroscience*, 27, 169-192. doi: 10.1146/annurev.neuro.27.070203.144230
- Royle, N. (2003). *The Uncanny* (1st ed.). Manchester, UK: Manchester University Press.
- Ryan, D., & Lachenmann, H. (1999). Composer in Interview: Helmut Lachenmann. *Tempo*, New Series (210), 20-24. Retrieved from <https://www.jstor.org/stable/946811>
- Ryle, G. (1951). *The Concept of Mind*. London, UK: Hutchinson's University Library. (Original work published 1949)
- Saygin, A.P., Chaminade, T., Ishiguro, H., Driver, J., & Frith, C. (2011). The thing that should not be: predictive coding and the uncanny valley in perceiving human and humanoid robot actions. *SCAN*, 7, 413-422. doi: 10.1093/scan/nsr025
- Saygin, A.P. (2012). What can the Brain Tell us about Interactions with Artificial Agents and Vice Versa? *Annual Meeting of the Cognitive Science Society, 2012, Workshop on Teleoperated Androids*.

- Score Follower. (2018, December 17). *Alexander Schubert – Point Ones [w/score]* [Video]. Retrieved from <https://www.youtube.com/watch?v=4e-QchRtyrs>
- Shelley, M.W. (1869). *Frankenstein; or The Modern Prometheus*. Boston and Cambridge: Sever, Francis, & Co. (Original work published 1818)
- Shimada, S. (2010). Deactivation in the sensorimotor area during observation of a human agent performing robot actions. *Brain and Cognition*, 72, 394-399. doi: 10.1016/j.bandc.2009.11.005
- Sound & Body*. (n.d.). Retrieved from <https://www.ictus.be/project/sound-body>
- Spadoni, R. (2007). *Uncanny bodies: The coming of sound film and the origins of the horror genre*. Berkeley and Los Angeles: University of California Press.
- Speaks, E. (2009). “We bring our lares with us”: Bodies and Domiciles in the Sculpture of Louise Bourgeois. *Art Journal*, 68(3), 88-103. Retrieved from <https://www.jstor.org/stable/25676493>
- Steinbeck, P. (2018). Listening to Voyager. *CTM Magazine*, 5, 44-48. Retrieved from http://paulsteinbeck.com/Paul%20Steinbeck_2018_Listening%20to%20Voyager.pdf
- The Uncanny*. (n.d.). Retrieved from <https://www.tate.org.uk/art/art-terms/t/uncanny>
- Tinwell, A., Nabi, D.A., & Charlton, J.P. (2013). Perception of psychopathy and the Uncanny Valley in virtual characters. *Computers in Human Behavior*, 29, 1617-1625. Retrieved from <https://doi.org/10.1016/j.chb.2013.01.008>
- Tinwell, A. (2015). *The Uncanny Valley in Games and Animation*. Boca Raton, London, New York: CRC Press.
- Tom Pauwels. (2013, December 15). *Francesco Filidei I FUNERALI* [Video]. Retrieved from <https://www.youtube.com/watch?v=5c8rm-fZeaE>
- Uncanny Valley (a monodrama)*. (n.d.). Retrieved from <http://natachadiels.com/musicpages/uncannyvalley.html>
- Uncanny Valley: Poems*. (2012). Retrieved from <https://www.amazon.in/Uncanny-Valley-Cleveland-University-Poetry/dp/1880834995>

- Urgen, B.A., Kutas, M., & Saygin, A.P. (2019). Uncanny valley as a window into predictive processing in the social brain. *Neuropsychologia*, 114, 181-185. doi: 10.1016/j.neuropsychologia.2018.04.027
- VR48: *Brief, Los Angeles*. (n.d.). Retrieved from https://www.schoenberg.at/index.php?option=com_content&view=article&id=983%253Avr01&Itemid=716&lang=en
- Wainright, L.S. (2019). Photo-realism. *Encyclopædia Britannica*. Retrieved from <https://www.britannica.com/art/Photo-realism>
- Weber, M. (2004). Science as a Vocation. In D. Owen, T.B. Strong (Eds.), *The Vocation Lectures*, (p. 13). R. Livingstone (Trans.). Indianapolis/Cambridge: Hackett Publishing Company. (Original work published 1919)
- Weisgall, H. (1959). The Music of Henry Cowell. *The Music Quarterly*, 45(4), 484-507. Retrieved from <https://www.jstor.org/stable/740598>
- Wendling, A.E. (2009). *Karl Marx on Technology and Alienation*. Houndmills, Basingstoke, Hampshire: Palgrave Macmillan.
- Zibrek, K., Kokkinara, E., & McDonnell, R. (2018). The Effect of Realistic Appearance of Virtual Characters in Immersive Environments – Does the Character’s Personality Play a Role? *IEEE Transactions on Visualization and Computer Graphics*, 24(4), 1681-1690. doi: 10.1109/TVCG.2018.2794638