

Open Research Online

The Open University's repository of research publications and other research outputs

Corporeality, musical heartbeats, and cinematic emotion

Journal Item

How to cite:

Winters, Ben (2008). Corporeality, musical heartbeats, and cinematic emotion. *Music, Sound, and the Moving Image*, 2(1) pp. 3–26.

For guidance on citations see [FAQs](#).

© 2008 Ben Winters



<https://creativecommons.org/licenses/by-nc-nd/4.0/>

Version: Accepted Manuscript

Link(s) to article on publisher's website:
<http://dx.doi.org/doi:10.3828/msmi.2.1.2>

Copyright and Moral Rights for the articles on this site are retained by the individual authors and/or other copyright owners. For more information on Open Research Online's [data policy](#) on reuse of materials please consult the policies page.

oro.open.ac.uk

Corporeality, Musical Heartbeats, and Cinematic Emotion¹

Film music's emotive power - in particular its ability to seemingly engender a state of suspense or even 'fear' when watching a horror movie - is well known, and is both recognised by spectators and exploited by filmmakers. We know, for instance, that turning down the volume may serve to alleviate some of the emotional symptoms experienced when watching a film on television, and that blocking one's ears in the cinema is far more difficult to accomplish than the less effective method of averting one's eyes.² Yet, perhaps because of the familiarity of the effect, there is comparatively little attention paid to this phenomenon in the rapidly growing field of film musicology: rather, studies are often content to posit some magical and ineffable link between so-called 'nondiegetic' film music and emotion, and to sidestep interesting philosophical or cognitive issues.³ In this article, then, I want to confront this phenomenon and tackle some of these issues head on, challenging many of our assumptions about the narrative status of film music and sound on the way. By invoking philosophical models of cinematic fiction offered by Kendall Walton and Gregory Currie, I will explain, firstly, what is happening when we think we are experiencing an emotion in the cinema as a result of film music or film sound, placing particular emphasis on 'fear.' This approach,

¹ This article has its origins in a paper given at the 'Sound, Music and Moving Image' conference in September 2007. My thanks are extended to the anonymous readers of the article and the editors for their suggestions, and to Dr Nicholas Atfield for his comments.

² As Robynn J. Stilwell notes in "Sound and Empathy: Subjectivity, Gender and the Cinematic Soundscape", 167-187 in *Film Music: Critical Approaches* ed. K. J. Donnelly (Edinburgh: Edinburgh University Press, 2001), 171.

³ Jeff Smith refers to the 'somewhat mysterious' connection between film music and emotion in "Movie Music as Moving Music: Emotion, Cognition, and the Film Score", 146-167 in *Passionate Views: Film, Cognition, and Emotion*, ed. Carl Plantinga and Greg M. Smith (Baltimore: The John Hopkins University Press, 1993).

broadly characterised by the notion of ‘perceptual realism,’ will suggest that a number of comfortable givens in film music theory (an assumed division between the nondiegetic source of music and the diegetic source of sound; and even the concept of nondiegetic music itself) can be questioned, thus moving the study of film music and film sound further away from the psychoanalytical tradition of much 1980s discourse, and reconstituting it within the context of philosophical studies of cinematic fiction.

Secondly, with this broader context in mind, I will suggest how filmmakers can use the sound of a heartbeat, or a musical representation thereof, to realise their narrative aims in the realm of horror and suspense. This more specific task will invoke empirical research undertaken by Arnie Cox - which suggests that there is a strong relationship between our response to music and our own ability to produce sounds⁴ - to propose a ‘heartbeat hypothesis.’ In combining the philosophical context of Walton and Currie’s theories of cinematic fiction with the empirical implications of Joanna Bourke’s statement that fear is fundamentally about the body - about its “fleshiness and precariousness”⁵ - the hypothesis suggests that we are not actually afraid when watching films like *The Thing* (John Carpenter, 1982) or *Alien* (Ridley Scott, 1979), but are merely simulating an imagined, fictional emotion, the sonic expression of which we situate in the film’s diegetic world. Moreover, the presence of the heartbeat helps us achieve this by encouraging us to equate a fictional character’s endangered corporeality with an awareness of our own sense of bodily precariousness. Once this hypothesis has been defined fully, I will use it to explore and interpret a number of film scenes that feature the sound of heartbeats or heartbeat rhythms in their scores; furthermore, I will posit that

⁴ Arnie Cox, “The Mimetic Hypothesis and Embodied Musical Meaning,” *Musicae Scientiae* Vol. 5 No. 2 (Fall 2001), 195–212.

⁵ Joanna Bourke, *Fear: A Cultural History* (London: Virago Press, 2006), 8.

there are wider implications of this heartbeat hypothesis for the way we respond emotionally to music in non-cinematic contexts that are of interest to musicology in general.

No-Thing to Fear?

In considering the notion of ‘fear’ in the cinema, a number of fundamental issues about our relationship with the cinematic medium are raised, issues that have been discussed in existing philosophical studies of film. In his ‘philosophy of horror,’ Noël Carroll, for instance, asks how we can be frightened by what we know does not exist; and why anyone would ever be interested in horror if it is so unpleasant.⁶ These age-old and pertinent questions have been asked of fiction as long as it has existed. Aside from Carroll’s own thoughts, important responses to the first question can be found in the writings of Schopenhauer and, more recently, Gregory Currie and Kendall Walton, while a consideration of the second is implicit in Hume’s study of tragedy, or in the aesthetic judgements of Kant, Edmund Burke, and Schopenhauer concerning the sublime.⁷ The first question is, however, of specific relevance to a study of cinema, and to the emotion-inducing qualities that are often ascribed to its music.

Evidently, we do not believe we are in the actual presence of a malevolent extra-terrestrial when watching *The Thing* or any other similar film. How then do we explain the emotional response that many of us undoubtedly feel? This reaction includes not only

⁶ Noël Carroll, *The Philosophy of Horror or Paradoxes of the Heart* (New York: Routledge, 1990), 8.

⁷ See David Hume, “Of Tragedy”, 183–200 in *Four Dissertations* with a new introduction by John Immerwahr (Bristol: Thoemmes Press, 1995); and Edmund Burke, *A Philosophical Enquiry into the Origins of Our Ideas of the Sublime and Beautiful*, 1793 edition (orig 1757) (London: J Dodsley, 1793). An excellent summary of these debates can be found in Julian Young, “Death and Transfiguration: Kant, Schopenhauer and Heidegger on the Sublime,” *Inquiry* Vol. 48 No. 2 (April 2005): 131–144.

elements of self-reported describable feelings (“that chilled my blood,” “my heart was thumping” etc.) but also scientifically verifiable physiological changes in pulse rate, body temperature and respiration. Clearly, the response is not an illusion. Nor can we accept, though, that what we feel is akin to a real-world state of fear: if it were, we would surely run from the cinema and most likely call the relevant authorities. Real-world fear, it seems, requires existence beliefs: we must believe that whatever is threatening us is not a fiction to spur us into action. Carroll’s metaphysical account of the effect that horror fictions have on us thus separates the response felt while engaging with the fiction (art-horror) from the real-life experience of such an emotion (horror). In his formulation:

I am...art-horrified by some monster X, say Dracula, if and only if 1) I am in some state of abnormal, physically felt agitation (shuddering, tingling, screaming, etc.) which 2) has been *caused* by a) the thought: that Dracula is a possible being; and by the evaluative thoughts that b) said Dracula has the property of being...threatening in the ways portrayed in the fiction and that c) said Dracula has the property of being impure, where 3) such thoughts are usually accompanied by the desire to avoid the touch of things like Dracula.⁸

While the last point is connected to Carroll’s distinction between horror (which involves an element of disgust) and mere fear, the thrust of his argument relies on an emphasis on ‘thought’ as distinguished from ‘belief.’ Carroll thus suggests it is the thought of the horror that generates our emotional state, rather than the belief that it actually exists, allowing us to dissipate our anxiety by averting our eyes or preoccupying ourselves with other thoughts.⁹

These ‘thoughts’ that Carroll identifies as constituting the cause of the emotion of art-horror can, in some senses at least, be identified with a number of concepts suggested by other thinkers concerned with the philosophy of fiction, namely: Gregory Currie’s

⁸ Carroll, *The Philosophy of Horror*, 27.

⁹ *Ibid.*, 80.

‘simulation hypothesis,’¹⁰ which explains the role of the imagination in fiction; and Kendall Walton’s emphasis on ‘make-believe’ and the resulting notion of ‘quasi fear.’ These, in turn, could be said to have their roots in David Hume’s description of the passion produced by ‘impossible evils’ or Schopenhauer’s idea of the will, as a relatively unsophisticated part of us that is unable to distinguish between imaginary ideas and real-life beliefs.¹¹ Indeed, Walton’s assessment of the nature of fiction and our emotional responses to it affords a central position to the power of imagination.¹² Although we may have genuine emotional reactions in the cinema and feel ourselves to be genuinely afraid, Walton argues, we are not, and cannot be, afraid of fictional monsters. Rather, we are participants psychologically in a game of make-believe; what we feel is ‘quasi fear’ - that is, we believe ourselves to be ‘fictionally afraid.’¹³ This notion of quasi fear seems to be one on which Currie and Carroll could also agree; that the emotion we feel in the presence of fiction - and that we may colloquially label ‘fear’ - though betraying some of the same physiological symptoms, is, in fact, different from the experience of real-world fear. Rather, it is born of the imagination and requires willing participation in the rules of the game; it is a question of thought rather than belief, and thus a cognitive experience rather than a perceptual illusion. When dealing with films, we might label such a concept ‘cinematic-fear.’

¹⁰ See Gregory Currie, *Image and Mind: Film, Philosophy, and Cognitive Science* (Cambridge: Cambridge University Press, 1995).

¹¹ See David Hume, “On the Passions,” 127–128 in *Four Dissertations* and Arthur Schopenhauer, *The World as Will and Idea* abridged in one volume ed. David Berman trans. Jill Berman (London: J. M. Dent, 1995), especially 91–92.

¹² Kendall L. Walton, *Mimesis as Make-Believe: On the Foundations of the Representational Arts* (Cambridge, Mass.: Harvard University Press, 1990).

¹³ *Ibid.*, 241–249.

Drawing upon Walton's work, Currie's simulation hypothesis is rooted in his attack on classical and psychoanalytic theory,¹⁴ in which he defends the notion of perceptual realism - that the experience of film watching approximates the normal experience of perceiving the real world - from the charge that film induces the *illusion* that fictional events are real. He rejects the tendency of film theory to assume that the viewer inquires about the psychological ownership of any given shot; this, he argues, is not his experience of cinema. For him, the experience of watching a film is like viewing the real world, not like viewing someone's subjective interpretation of the real world; thus, we should regard the cinematic image as rendering events objectively and only allow a subjective interpretation when no plausible objective explanation is available.¹⁵ His hypothesis therefore argues that we, as audience members, take on the beliefs and desires we imagine the characters we see on screen must have; in other words, we simulate their responses. These simulated beliefs are, however, run 'off-line,' without prompting, for example, the flight-or-fight response induced by real fear. Crucially, though, Currie argues that "simulated beliefs and desires retain their internal connections to our bodily states...The anxiety that watching horror movies induces in me does not cause me to call the police, but it does cause me to *feel* afraid."¹⁶ This is an important point, to which I will have recourse in the second part of this essay when music and emotion's links with the body are examined.

Currie's simulation hypothesis also threatens to overturn many existing philosophical accounts of musical emotion: after all, how can music make us afraid in a

¹⁴ See also Gregory Currie, "Film, Reality, and Illusion," 325-344 in *Post-Theory: Reconstructing Film Studies*, ed. David Bordwell and Noël Carroll (Madison: University of Wisconsin Press, 1996).

¹⁵ Currie, *Image and Mind*, 164-196.

¹⁶ *Ibid.*, 156.

real-world sense when it either refers to something that does not exist (if we accept that music is in some senses representational) or has no representational content? These questions have long been debated in wider musical contexts by Peter Kivy, a proponent of the cognitivist position that argues that we are not experiencing an emotion when listening to music (as emotivists like Colin Radford, Jerrold Levinson, and others would argue),¹⁷ but are merely recognising its expression.¹⁸ Kivy's position is, to some extent, supported by Currie and Walton's arguments: since we can only be fearful, rather than *fictionally* fearful, about something that we believe to exist, musical emotivism - like the notion that fictions produce real-world emotions - must be wrong. Its critics, in claiming that there is no object about which we can be angry or happy or sad or fearful, seem to be correct:¹⁹ music is unable to produce the real-world emotion of fear, either in the concert hall or in the cinema. Yet, cognitivists like Kivy fail to acknowledge that we may respond to this expression of fear with a corresponding *fictional* emotion, simulating a response and producing the reaction that emotivists are all too ready to point out. As with Walton's explanation of quasi-fear, then, the spectator in the cinema (and indeed the listener outside of it) can be considered a willing participant in a game of make-believe, a game in which, in many cases, the music plays an important part. In this game, we imagine that someone in the fiction is afraid; moreover, we often recognise this as a direct result of expressive qualities of fear in the music or sound design of a film.

¹⁷ Colin Radford claimed to be an emotivist regarding sad music, but not 'angry' music in "Emotions and Music: A Reply to the Cognitivists," *Journal of Aesthetics and Art Criticism* Vol. 47 No. 1 (1989): 69–76. See also Jerrold Levinson, "Music and Negative Emotions," *Pacific Philosophical Quarterly* Vol. 63 No. 4 (October 1982): 327–346.

¹⁸ Peter Kivy's *Sound Sentiment: An Essay on the Musical Emotions Including the Complete Text of The Corded Shell* (Philadelphia: Temple University Press, 1989)

¹⁹ Kivy makes this point in *Sound Sentiment*, 32.

There are huge implications here for those theories of film music and sound influenced by psychoanalytic suture theory,²⁰ since the idea of simulated emotions, game-playing, and the perceptual realism that underlies it, not only implies a degree of cognitive awareness of music, but also suggests that the concept of a nondiegetic music source may be unnecessary. If, as psychoanalytic accounts of film have previously suggested, the experience of watching cinema is supposed to create the illusion of a subjective reality - rather than approximating the experience of objectively perceiving the world - then music not immediately apparent as diegetic becomes a problem. We are forced to ascribe it (for the most part) to some unseen nondiegetic presence, who thus becomes a manipulative, secondary force interpreting the fiction for us. This is at the root of Eisler and Adorno's Marxist critique, and Gorbman's adaptation of it within the context of 1980s suture theory.²¹ If, as Currie suggests though, perceptual realism is the most convincing explanation for the cinematic experience, then we can naturally ascribe all the music we hear to the world in which the characters inhabit: they may not always give an indication that they hear it, but it may be there nonetheless. Although perceptual realism suggests that we accept the film world, as it is presented to us, as corresponding with our everyday experience of the world, we do not succumb to the illusion that what we are watching is real.²² The fiction is imagined, and this imagined world may be believably saturated with the sound of music. It makes little sense, after all, to imagine

²⁰ See Claudia Gorbman, *Unheard Melodies: Narrative Film Music* (Bloomington: Indiana University Press, 1987), which is also heavily dependent on the Marxist-motivated tenet of Hanns Eisler and Theodor Adorno's 1947 book *Composing for the Films* (London: Athlone Press, 1994).

²¹ Jeff Smith argues for a redress in the balance so that psychoanalytical models of film narration are applied only when rationalist and cognitivist explanations break down ("Unheard Melodies? A Critique of Psychoanalytic Theories of Film Music", 230–247 in Bordwell and Carroll [eds.], *Post-Theory*). Similarly, Jerrold Levinson's sketch of music's narrative power is bound up with his rejection of the inaudibility claim ("Film Music and Narrative Agency", 248–282 in Bordwell and Carroll [eds.], *Post-Theory*).

²² See Currie, *Image and Mind*, 164–198.

the worlds of such classically-conceived films as *Star Wars* (George Lucas, 1977) or *Raiders of the Lost Ark* (Steven Spielberg, 1981) existing independently of their John Williams scores; indeed in *Star Wars*, music functions exactly as Obi-wan Kenobi describes the mythical ‘force’ as an energy field that surrounds all living things and binds the galaxy together.²³ In other films, too, we might posit an omniscient and omnipresent narrator personality, who is acting on a less consciously mythic plane than the ‘force’ in *Star Wars* but is, nonetheless, intra-diegetic and whose musical outpourings reflect and help create the fictional world. As a result, the narrative distinction between diegetic and nondiegetic music and sound in these circumstances also becomes largely meaningless. When the music or sound is expressive of a character’s fear, then, it can be understood as emanating from that character, even though they may be unaware that they are producing it; when the character seems oblivious of the danger, and the music or sound retains these expressive devices, it may be understood as the product of an all-seeing (yet unseen) intra-diegetic figure, who reacts to their peril by shaping their ambient sound-world. In either case, we as spectators may recognise these expressive devices as located within the world of the film and simulate the fear the characters feel.

I would certainly not like to deny that our experience of cinema precludes the presence of some extra-diegetic force - what Currie calls an implied author who helps us interpret the cinematic text by reference to a personality that seems to have created it.²⁴ Nor do I want to reject Jerrold Levinson’s similar idea of a ‘perceptual enabler’ who is not only vital “to explain how it is we are, even imaginarily, perceiving what we are

²³ In this way, it might function in a similar way to Matt Bailysea’s conception of the Wagnerian orchestra. “The Struggle for Orchestral Control: Power, Dialogue, and the Role of the Orchestra in Wagner’s *Ring*,” *19th-Century Music* Vol. 31 No. 1 (July 2007): 3–27.

²⁴ Currie, *Image and Mind*, 262.

perceiving of the story, in the manner and order in which we are perceiving it”²⁵, but also expresses him/herself musically. But equally, I would not like to suggest that such a figure is always *required* in order to explain the philosophical source of music in film. If we regard the music as expressive of someone’s real world emotion, for example, the originator of that emotion must necessarily belong inside the diegesis, since for someone outside the diegesis who imagines that person’s emotion and expresses it in music, such a real-world emotion would not be possible - s/he would not *believe* in the object that causes the emotional reaction. In these situations, it makes more sense for us to ascribe both the source and the subject of the musical expression to the same, intra-diegetic personality - whether a character that we see, or an omniscient, omnipresent and unseen narrator²⁶ - rather than construct a nondiegetic voice whose music fictionally expresses the emotions it imagines that intra-diegetic personality to possess. As Currie points out astutely “imagining that someone imagines P tend[s] to collapse into imagining P.”²⁷ Similarly, if we try to imagine a nondiegetic figure imagining a diegetic emotion, it quickly collapses into us simply imagining that emotion. It may seem a slight point, but if we follow its implications, the result is often a fictional world saturated with music, rather than a music-free world to which music is added by a nondiegetic voice. This approach thus gives greater weight to music in constructing the cinematic diegesis than existing accounts tend to offer. Different film genres and styles may admittedly demand various interpretive approaches, with fantasy films that bear little resemblance to our everyday reality (including many horror films) more easily understood in this way than realistic contemporary drama or documentary. Yet, the important point is that the music

²⁵ Levinson, “Film Music and Narrative Agency,” 252.

²⁶ Currie classifies a narrator as “intra-diegetic.” *Image and Mind*, 262.

²⁷ *Ibid.*, 159.

commonly referred to as the dramatic score need not necessarily originate externally to the world of the film, and need not always be distinguished (in its narrative status) from the music and/or sound that the characters acknowledge they hear.

It is now possible, then, to state a position that describes what is often happening, philosophically, when we think we are afraid in the cinema. We are not actually afraid - of the images, dialogue, music, sound or anything else - but merely fictionally afraid. We imagine, partly through recognising the expressive qualities of music, that someone (a character or intra-diegetic personality) is afraid in the fiction and is expressing him/herself musically. As Currie's simulation hypothesis argues, we then take on the beliefs we imagine that 'someone' to have, but run them 'off-line,' producing what I would term cinematic-fear. The recognition of film music's expressive qualities and the spectator's active locating of them within the diegesis thus suggests that a far more cognitive-based approach may be warranted than the inaudible, invisible model of classical discourse, with its mystical connection between expression and emotion. The second part of the article aims to suggest just such an approach for interpreting passages of film sound and music containing heartbeat rhythms, an expressive device that has a remarkable power to convince me that I am afraid, or (at the very least) uneasy. Furthermore, I will propose an eight-point 'heartbeat hypothesis' that will allow us to model the response.

Cinematic-Fear and the Body: A Cognitive Model

I stated above that our emotional response to films - which includes not only elements of self-reported describable feelings but also scientifically verifiable physiological changes

in pulse rate, body temperature and respiration - is clearly not an illusion. Nor is this the case with our response to music, both within and outside of the cinema. Remembering Currie's statement that "simulated beliefs and desires retain their internal connections to our bodily states," we might ask: what, then, is the link between cinematic emotions and the body, and are these responses the same as their real world equivalents? It seems to be a generally accepted given, after all, that a link between real world emotions and physiological reactions as detected in the autonomic nervous system (blood pressure and flow, and respiration) exists, although the extent to which these changes allow us to distinguish between the emotions felt is, on the other hand, far more contested.²⁸

As Robert Levenson has pointed out, this link is intuitively recognised in the language we use to describe our emotions: we talk of our blood running cold, or of our hearts pounding.²⁹ Furthermore, empirical studies bear this out and suggest that physiological responses to emotion can indeed be detected in the autonomic nervous system, whether or not individual emotions can be distinguished. Arne Öhman's investigation of fear and anxiety, for example, found that these related emotions resulted in both cognitive/psychic anxiety and somatic overreactivity (manifested in sweating, flushing, shallow breathing, heart palpitations, intestinal discomforts, and aches and pains).³⁰ Moreover, studies that examine reactions to concert hall music—responses that are also best understood in terms of fictional emotions—suggest that cinematic emotions may also result in similar physiological responses.

²⁸ See Richard J. Davidson, "Complexities in the Search for Emotion-Specific Physiology," in *The Nature of Emotion: Fundamental Questions* ed. Paul Ekman and Richard J. Davidson (Oxford: Oxford University Press, 1994), 239.

²⁹ Robert W. Levenson, "The Search for Autonomic Specificity," 252-257 in Ekman and Davidson, *The Nature of Emotion*.

³⁰ Arne Öhman, "Fear and Anxiety as Emotional Phenomena: Clinical Phenomenology, Evolutionary Perspectives, and Information-Processing Mechanisms," in *Handbook of Emotions* ed. Michael Lewis and Jeanette M. Haviland (New York: Guilford Press, 1993), 513.

Carol Krumhansl's 1997 psychophysiological³¹ study of musical emotions, for instance, is perhaps the most persuasive evidence that "the presence of music produce[s] changes in physiology...[and] the physiological measures were different for the intended Sad...intended Fear...and intended Happy extracts."³² In measuring a number of physiological indicators—including pulse transmission times, respiration rates, blood pressure, skin conductance level, and finger temperature—in response to six selections of music "intuitively chosen" to represent basic emotions, Krumhansl concluded that "although the question of emotion-specific physiology remains somewhat elusive"³³ musical emotions are, indeed, reflected in psychophysiological measures that "argue against the cognitivist position."³⁴ Similarly, Mine Dogantan-Dack has concluded that there is ample evidence to suggest that music "affects the body internally, causing physiological changes ranging from mild to profound in listeners."³⁵ Whether this can be compared directly with the physiological responses to emotion that did not involve music could certainly be debated;³⁶ in any case, it seems that fictional emotions (felt in the presence of music) do not produce such specific physiological changes in the autonomic nervous system that they could ever be reliably aroused and differentiated through purely musical means. Rather, what Krumhansl's work with music and other studies into

³¹ Psychophysiology has been defined by Hugdahl as the "study of brain-behaviour relationships in the framework of peripheral and central physiological responses." Cited 339 in Carol L. Krumhansl, "An Exploratory Study of Musical Emotions and Psychophysiology," *Canadian Journal of Experimental Psychology* Vol. 51 No. 4 (1997): 336–352.

³² *Ibid.*, 343.

³³ *Ibid.*, 351

³⁴ *Ibid.*, 350. Aside from the physiological measurements involved, subjects were also asked to assess their own emotional responses. Krumhansl acknowledges, however, the issue of culture and its effect on these processes had not been adequately examined at the time of writing.

³⁵ Mine Dogantan-Dack, "The Body Behind Music: Precedents and Prospects" *Psychology of Music* Vol. 34 No. 4 (Oct. 2006), 450.

³⁶ Patrick N. Juslin and Marcel R. Zentner have pointed out that a certain amount of disagreement exists on this issue. "Current Trends in the Study of Music and Emotion: Overture," *Musicae Scientiae* Special Issue (2001–2002), 9.

emotion have revealed conclusively is that the presence of music does produce physiological changes.

In turn, Arnie Cox's mimetic hypothesis - which holds that "part of how we understand human movement and human-made sounds is in terms of our own experience of making the same or similar movements and sounds"³⁷ - allows us to understand these changes and the music that prompts them. Cox contends that muscular-emotional responses are integral to our normal understanding of music because we often imagine what it is like to make the sounds we hear. This is primarily an unconscious imagining, and Cox points to the habit of 'singing along' in our head with imagined instrumental music as a way of imitating, and thus understanding, the sounds of instruments. This close connection between music and physiological response suggests that we might interpret the heartbeats we hear in the cinema (either encoded subtly in the music or openly presented as recorded sound) in terms of our own bodily sounds. Not only would we recognise the heartbeat as expressive of fear then but, in recognising it, it would also focus our attention on our own heartbeat. Since we tend to be particularly aware of our own corporeality in states of real danger, I suggest that this makes it easier to simulate a fictional character's fear and thus produce in us a cinematic emotion. The mimetic hypothesis might also provide an explanation for why we might find ourselves unconsciously 'imitating' the emotion seemingly being expressed, in addition to any willing participation in a game of make-believe. Cox has written of the human body's attempts to imitate so that the phenomenon of pupil dilation can be explained not only as an expression of interest but could also "be part of how we participate: one way we show

³⁷ Cox, "The Mimetic Hypothesis," 196.

interest is by unconsciously imitating and becoming *like* one another.”³⁸ Recognising (consciously or unconsciously) the presence of a heartbeat in the music might therefore stimulate a physiological reaction that attempts to, in some sense, imitate the heartbeat we hear. Coupled with other representational information in the sound or images, this heartbeat might indeed arouse cinematic-fear.

Thus we can articulate a multi-point ‘heartbeat hypothesis’ that applies the empirical, cognitive-based research of Cox to the philosophical question of fictional emotions, and the concept of cinematic-fear.

It holds that, in cases where heartbeats are present alongside other representational information suggesting danger, and the spectator reports feeling afraid:

- 1) s/he is not feeling actual fear but is merely experiencing cinematic-fear;
- 2) this cinematic-fear is a result of the spectator simulating the fear-inducing beliefs that s/he imagines someone in the fiction to hold, whether that someone is a) one or more of the characters in the film, or b) another intra-diegetic personality (such as a narrator);
- 3) this simulation is *aided* by the presence of a heartbeat, which (upon closer examination) s/he might assume a) to be expressive of the fictional state of fear held by the characters, narrator, or other intra-diegetic personality in the film, or b) to actually emanate from the body of one of these persons;³⁹
- 4) that this heartbeat a) will take on a generic iambic character, if it is merely expressive of the fictional state of fear held by someone in the film, or b) may also reflect the reality of a raised heartbeat, if it can also be said to emanate from the body of one of these intra-diegetic persons (either as recorded sound or as musicalised sound - that is, sound represented in musical form);
- 5) that this heartbeat draws the spectator’s attention to a character’s endangered corporeality;
- 6) that since the mimetic hypothesis holds that we understand musical sounds in terms of our own bodily sounds, the presence of a heartbeat reminds the spectator of his/her own corporeality;

³⁸ Ibid., 199.

³⁹ Indeed, in addition to a sense of ‘self’ (as internal sound), a heartbeat recognised as existing outside our body can also be a strong indicator of the presence of the ‘other.’

7) that, since we are more aware of our physiology in a state of real fear, being reminded of his/her corporeality makes it easier for the spectator to simulate a state of fictional fear; and furthermore

8) that this may be a process over which the spectator has varying levels of control and awareness so that s/he may occasionally wrongly interpret the conscious awareness of his/her heartbeat, triggered by the presence of a heartbeat in the film, as a sign of actual real-world fear, though s/he knows such an emotion to be impossible.

This last point may seem to offer tacit support for the idea of ‘inaudibility’ and thus threaten to open the door for a return to a Gorbman-esque position—despite my invoking of the idea of perceptual realism, and my rejection of the monologic and manipulative nondiegetic voice. Yet while Cox’s mimetic hypothesis might suggest that we have little control over our physiological reaction to a sound that our bodies are capable of producing, we may be entirely aware of that reaction and of the sonic stimulus that helps cause it. Nothing about the heartbeat hypothesis relies on the music somehow being ‘unheard,’ slipping in unnoticed to manipulate the spectator into a state of cinematic-fear. Nor does it really bond us to the characters in a psychological way; although it may help us to appreciate the fictional emotions they are experiencing, this is an imagined, cognitive response, not a psychological illusion. Although it is evidently a well-known compositional and sound design device used by filmmakers, we do not require a psychoanalytic model to explain the heartbeat’s effect, and it appears to work equally well whether or not it is consciously noticed. If we hear a heartbeat and recognise it as such, ascribing it to a particular character, we are naturally drawn to considering our own heartbeat and therefore share the concern expressed by the character in a state of fictional fear for his/her own corporeal precariousness; indeed, an awareness of one’s own body is a fundamental characteristic of an emotional or, in this case, quasi-emotional state. If we

do not recognise a heartbeat, though, or are unaware of its presence in the sound mix, our recognition of it as a bodily sound may indeed be unconscious. We may then recognise the fact that our own heart is beating faster but not link it to the sound emanating from the speakers in the cinema. In either case, whether we are aware or not, the effect is the same. Furthermore, this conscious engagement with music suggests that we may sometimes be able to limit our involvement with a film's emotional content to the level of cognitively recognising the expression of fear in the music (and the rest of the narrative) without simulating that fear. How we respond might well differ according to other factors, such as our prevailing emotional state and the context in which we are watching the scene. In other words, we can choose not to play the game.

Applying the Heartbeat Hypothesis

In discussing the compiled score and sound design of Stanley Kubrick's *The Shining* (1980), Kevin Donnelly notes that, among the intermittent burst of musical sounds, the sound of a heartbeat can be heard.⁴⁰ He goes on to mention that:

Music is related to bodily and life rhythms, through the essence of volume, beat and pulse perhaps more than timbre, pitch and harmony. The most primitive (and most primal) musical moments in cinema are stingers [sudden *sforzando* chords], which engage with the audience on the most basic levels.⁴¹

Music in horror films often attempts a direct engagement with the physical...[These sounds are] tied to the intrinsic sounds of the human body: the high buzz of the nervous system and the deep throb of the bloodstream and heart.⁴²

Donnelly's comments suggest something of the power of music to connect with an audience's sense of corporeality and this, evidently, has a long and distinguished history,

⁴⁰ Kevin Donnelly, *The Spectre of Sound: Music in Film and Television* (London: British Film Institute, 2005), 36.

⁴¹ *Ibid.*, 95.

⁴² *Ibid.*, 105.

with classic horror films like *Bride of Frankenstein* (James Whale, 1935) and *Dr Jekyll and Mr Hyde* (Rouben Mamoullian, 1932 and Victor Fleming, 1941) springing to mind: Franz Waxman's score to *Bride of Frankenstein*, for instance, features a timpani pedal E to simulate the beating of the Bride's revived heart, while his score for the 1941 *Dr Jekyll and Mr Hyde* also uses a timpani heartbeat in the transformation scene, something that the earlier Rouben Mamoullian version accomplishes with recorded sound.⁴³

Andra McCartney's discussion of how science-fiction soundtracks index sonic intimacy—and thus reflect and intensify urban anxieties about sounds of 'alien' species that are associated with wilderness environments—picks up on similar concerns.⁴⁴ McCartney notes how, in *Alien*, the sounds of insects are used to index anxiety in the main character while 'bodily sounds' are used to indicate danger; she draws attention to the 'birth' scene, which includes a heartbeat, while the eponymous alien is constantly associated with intimate, 'wet' sounds.⁴⁵ Robynn Stilwell, too, in her discussion of the film *Closet Land* (Radha Bharadwaj, 1990) hints at the way that music can be empathetic and suggest bodily processes: "An outbreak of Taiko (Japanese)-style drumming provides an excellent outward expression of [the woman's] panic and kinetic mimicry of her pounding heart and racing thoughts."⁴⁶ Clearly, then, some vague idea of the connection between bodily sounds (particularly heartbeats) and states of cinematic-fear has been noted before. Yet what the heartbeat hypothesis now provides us with is an interpretative model for film narrative that sits in a philosophical tradition of fiction, supported by

⁴³ Another classic-era example can be found in Laurence Olivier's 1948 version of *Hamlet*, which features an irregular heartbeat when the King's ghost first appears.

⁴⁴ Andra McCartney, "Alien Intimacies: Hearing Science Fiction Narratives in Hildegard Westerkamp's *Cricket Voice* (or "I don't like the country, the crickets make me nervous,")" *Organised Sound* Vol. 7 No. 1 (April 2002): 45–49.

⁴⁵ *Ibid.*, 47–48.

⁴⁶ Stilwell, "Sound and Empathy," 177.

empirical studies of emotion, and which balances the hitherto dominant classical-psychoanalytic models offered by Gorbman. The following discussion thus suggests how the model might be applied, with examples drawn from a number of films.

A straightforward example is provided by Alan Silvestri's score to *Contact* (Robert Zemeckis, 1997), in which a heartbeat rhythm is heard when Ellie (Jodie Foster) spots a known terrorist and his bomb on a TV monitor. Ellie is essentially powerless and can only communicate the information to a colleague on the radio: clearly, her concern for the terrorist's potential victims suggests that the music, in being expressive of her fear, emanates from her and, as a result, we are more able to simulate that fear and share in her suspense. Similarly, in *Gattaca* (Andrew Niccol, 1997) - a film that is particularly concerned with awareness of the body in its themes of genetic engineering and bodily disguise - Vincent (Ethan Hawke) lives in fear of being discovered as an 'in-valid.' In the gymnasium scenes, his audible (and false) diegetic heartbeat is heard alongside heartbeat rhythms in Michael Nyman's music, expressing the fear that he will be discovered and allowing us to simulate that emotion. More recently, Jonny Greenwood's score to Paul Thomas Anderson's film *There Will Be Blood* (2007) demonstrates that the device is still much favoured in scenes of high tension, featuring a driving heartbeat rhythm as Daniel Plainview (Daniel Day-Lewis) searches for his son following an oil-well explosion: again, the music is clearly expressive of Plainview's fear. As these are musical expressions of fear, rather than actual heartbeats (recorded or musicalised), it matters not whether they accurately describe a body in a state of fear; it is enough for us to recognise them as heartbeats to allow us to simulate the character's emotion.

The nature and source of the music is not always so clear, however, and it may sometimes be the case that the heartbeat we hear can be interpreted as the physical sound of a heart beating, in addition to functioning as an expressive indication of a character's fear; this might be either as recorded sound, or as musicalised representation of that sound. In either case, as the heartbeat hypothesis tells us, if the spectator feels afraid, s/he must also be simulating someone's fear-inducing beliefs in the fiction: the heartbeat will therefore always function, first and foremost, as expression. In the 1971 film *The Andromeda Strain* (Robert Wise), for instance, a team of scientists search for an unknown and deadly toxin, accidentally released on an unsuspecting town by a crashed space probe sent out to search for extraterrestrial life. With the probe under the microscope, two of the scientists (Dr Jeremy Stone, played by Arthur Hill, and Dr Ruth Leavitt, played by Kate Reid) look for answers. As the camera zooms in closer to a green patch on the probe's surface, the electronic score composed by Gil Mellé introduces an unmistakable heartbeat.⁴⁷ This heartbeat becomes louder as the camera zooms in closer, and ceases when it cuts away, suggesting that the sound emanates from this green patch, which we later discover to be a non-organic life form. As it is entirely regular, it perhaps suggests an alien body unafraid of being probed by human science, entirely devoted to the task of reproduction and possibly unaware of the malevolence it poses to humankind. Though the life is later revealed to be crystalline and therefore without a heart or blood, it pulsates organically as it multiplies. The heartbeats could be said to fulfil both criteria in point 4 of the hypothesis then: they emanate from the alien life, but if the spectator feels cinematic-fear, they must also be expressive of someone's diegetic fear. Since the

⁴⁷ The difficulty in distinguishing between diegetic and nondiegetic sound/music in this film suggests that these terms may be unhelpful. As suggested earlier, we need neither concept to account for the fictional world we are observing.

scientists do not appear to be all that concerned, this fear may belong to an intra-diegetic narrator, who *believes* that this is the Andromeda strain that threatens the entire planet, or even the life form itself, anticipating its possible annihilation at the hands of humanity (for all its outward signs of coolness). In either case, the heartbeat hypothesis suggests that the spectator's conscious or unconscious recognition of the sounds as heartbeats focuses attention on his/her own fragile physiology, and s/he is better able to simulate the emotion of fear as a result.

In *Alien*, the spectator is presented with a sequence that is still more complicated, featuring multiple uses of heartbeats and heartbeat rhythms; yet, while traditional studies of film music theory might try and categorise these sounds as either diegetic or nondiegetic, the heartbeat hypothesis suggests they are all equally important in defining the world of the film, and are hence intra-diegetic. As Captain Dallas (Tom Skerritt) crawls about in his ship's dimly-lit air ducts trying to flush out the eponymous alien with a flame-thrower, we hear three sets of heartbeats in the sound mix: the recorded sound of a human heartbeat; the beeping of an electronic tracker with a distinctive heartbeat rhythm; and an iambic rhythm in Jerry Goldsmith's underscore.⁴⁸ As the alien gets closer, fear mounts in the other characters observing. Like us they are removed from the immediate situation; they only have their imaginations, two dots on a screen that seem to be growing ever closer, and Dallas's confusion on the radio. They, too, can hear the sound of an electronic heartbeat to add to their own, and terror eventually takes hold: Lambert (Veronica Cartwright), almost sobbing, exhorts Dallas to "get out of there." The electronic heartbeats of the tracking device become quicker and we get a glimpse of the

⁴⁸ The sound editing is by Jim Shields.

alien accompanied by the sound of an inhuman scream. The screen is overtaken with static and the heartbeats stop.

Unlike the spectator, the characters believe the alien to be real, that it poses a real threat from which they may be forced to fight or flee; we, in contrast, do not believe, but merely entertain the thought that this creature is a possible being - one that lives in a musicalised world. The heartbeats, in drawing our attention both to the fear expressed in the diegesis and our own bodies, help us to simulate their emotions. The electronic tracker's heartbeat, for example, is overtly audible to both Lambert and the audience, and, as such, we are particularly aware of it as part of the narrative; while its presence and source are unquestioned, the effect it has on our mounting sense of cinematic-fear should not be underestimated. This is one heartbeat to which we consciously attend and apply cognitive reasoning: like Lambert, we know that it signals danger in the diegesis in a real way (indeed it gets faster as the alien approaches). While it is not, at first glance, expressive of anyone's emotional state in itself, it is capable of provoking a reaction. It points beyond itself to information that makes us and the characters afraid for Dallas's life, namely that a terrible threat is growing ever closer; the fact that it uses a heartbeat rhythm to achieve this is interesting, since it reveals an intuitive grasping by the characters in the film (who have constructed this tracking machine) of the link between an awareness of bodily sound and danger.⁴⁹

While the electronic heartbeat plays a foreground role in the diegesis, the human heartbeat heard in this sequence is arguably less noticeable. It might be interpreted as an amplified version of one of the character's own bodily sounds (Michel Chion's category

⁴⁹ Similarly, the fire alarm heard in *The Thing* is also a heartbeat rhythm; it is used by MacReady (Kurt Russell) to signify danger and to summon help.

of internal sound for example⁵⁰) and our ability to imagine ourselves feeling the emotions of the character is thus a result of a greater awareness of our own bodily precariousness. The most obvious candidate for the heartbeat's source might be Dallas himself, since we also hear his breathing, but it could also be interpreted as the sound of the ship: her computer brain is referred to as "mother" and its interface is accessed via a womb-like room. We hear the sound of 'mother's' maternal concern for her captain, a fear born of beliefs that we simulate and run off-line. With this interpretation, the heartbeat is fundamental to the simulation; without it, we would not very easily be able to entertain the idea that 'mother' is afraid. Curiously, the human heartbeat is relatively loud in the first half of the sequence, but becomes far less noticeable as soon as Lambert begins to track the alien. It disappears along with the electronic heartbeat when all trace of the alien is lost. This moment, which we might assume to be the most fear-inducing point, is a point at which the audience can relax precisely because of the absence of any heartbeat. Lambert's fear only starts to show when the electronic tracking device begins again in earnest, followed by a restart of the human heartbeat, now clearly attached to Lambert's mounting terror and growing faster as a result. The iambic rhythm in the music, which appears momentarily when Lambert first begins to track the alien, and is disguised through the presence of a melodic line, is more covert still. It is a generic heartbeat rhythm that functions expressively to indicate the fear of the filmic world's intra-diegetic narrator, echoing in sympathy both the bodily sounds of the ship and the electronic sounds of the tracker.

Deciding whether the heartbeat is merely functioning expressively, or if it also describes a physical heart beating can help in interpreting the source of the music. In

⁵⁰ Michel Chion, *Audio-Vision: Sound on Screen* (New York: Columbia University Press, 1994), 76.

Steven Spielberg's 2005 *War of the Worlds*, for instance, we are presented with the unveiling of the aliens' fighting machine in a way that suggests the characters' developing fear. Following a diegetic crescendo of composed sound (seemingly the whine of a jet engine), the camera pulls back to reveal what composer John Williams has called one of the most terrifying things he has seen on screen.⁵¹ Williams's underscore begins to stir: a repetitive compound duple-metered rhythm in the bass begins (repeating quavers grouped in accented trochees – a reverse heartbeat). This low pulsing, which coincides with the 'awakening' of the aliens as their machine stretches from its lazy slumbers, could be sourced as the musicalised sound of an alien physiology limbering up, like the green blob's heartbeat in the *Andromeda Strain*. Yet, the accented trochaic rhythm might be better interpreted as an expression of the human protagonists' mounting fear, the corporeal pulse of blood rushing around a body primed for fight or flight. This repeated pulse continues as Ray (Tom Cruise) and his fellow witnesses flee the scene, but stops momentarily as curiosity overcomes the desire to flee. It thus seems to belong to them; their fear seems to produce it. With no immediate danger sensed by the characters, a sense of the sublime (the bittersweet combination of awe and fear) is suggested, and the music stops. By hearing the trochaic rhythm as a representation of the rushing blood of the autonomic nervous system, then, we are reminded both of the witnesses' corporeality and of our own, fragile, bodies. Indeed, as spectators, we too are witnesses of a kind - as the scene continues, part of it is observed through a dropped video camera, thus intentionally drawing attention to the way in which we interpret the world through cinematic means.

⁵¹ See the documentary "Scoring *War of the Worlds*" on the Region 2 DVD release of the film, Paramount Home Entertainment PHE8883, 02:25. The sound design for the film is by Randy Thom, Michael W. Mitchell, and Richard King.

Ennio Morricone's score to *The Thing* provides one of the most interesting examples to which we can apply the hypothesis because, in contrast to *War of the Worlds*, the heartbeat in question seems far too slow to be attributable to any human source in the diegesis (it equates to around 25 beats a minute).⁵² It is heard in the film's first scene as a dog is chased across the snows of the Antarctic by a Norwegian helicopter. It might be regarded at first, then, as purely expressive of someone's fear - either the Norwegians or the film's intra-diegetic narrator figure, the only persons who are aware that the dog is, in fact, the dangerous Thing in canine form (at this point the occupants of the US research station are, like the spectator, ignorant of this). Yet, the very fact that the heartbeat does not seem to relate to the rhythms of human physiology hints at its (secret) identity. It suggests that, in addition to this role as an expression of the narrator's fear, the heartbeat *also* describes an actual heart beating. This can only be the sound of the Thing's alien heart: cold, incalculable, incapable of excitement or emotion, only intent on survival whatever the cost to the human race. The music thus reminds the audience of just how different their own fragile bodies are, of their precariousness, and their inability to cope with the Thing's agenda of bodily possession.⁵³ The film's themes of paranoia, identity loss, and the breakdown of trust between friends are certainly ripe for psychoanalysis; indeed, as Dennis White argues, in cases of body possession in horror films, "When we see this integrity violated it is a threat to our ego's ability to protect itself because it dramatizes the failure of another ego to protect itself."⁵⁴ Yet, the threat here is not merely psychological but also physiological: although the Thing appears to

⁵² This is running on a region 2 DVD (PAL colour system) at 25 frames per second. It would be 4% slower in the cinema or on an NTSC disc running at 24 frames per second i.e. c24 beats per minute.

⁵³ See Anne Bilson, *The Thing*, BFI Modern Classics (London: BFI, 1997), 63–64.

⁵⁴ Dennis L. White, "The Poetics of Horror: More than Meets the Eye," *Cinema Journal* Vol. 10, No. 2 (Spring 1971): 1–18, 9.

impersonate its victims, it has also already consumed their frail bodies in a particularly grisly fashion; it merges with them at a cellular level, probing them in the most intimate of ways. The sound of an alien heartbeat focus our attention on the sounds of our own, threatened physical existence and reminds us that the Thing's body is stronger, calmer, more focussed, able to overpower the human characters' overexcited, fear-fuelled physiology.

Moreover, as the heartbeat hypothesis proposes, the musicalised sound of the Thing's heart focuses the spectator's attention on his/her own heartbeat, which - in contrast to the Thing's calm, methodical, metronomic beat - is pounding away in anticipation of the danger that is threatened. The theme returns on only several further occasions, most notably at the ambiguous end of the film when MacCready and Childs are left doomed to freeze to death. Each is uncertain as to whether the Thing has survived, perhaps disguised as the other, and is merely waiting for the fires they have started to die, and its preserving freezing process to begin, ready to lie dormant until the next group of unsuspecting scientists dig it up. This rather bleak ending is compounded as the heartbeat returns, suggesting that The Thing has indeed survived and lives to fight another day. Indeed, the end titles finish with it as a solo, implying that the film world's intra-diegetic narrator remains 'afraid' even after the imposition of the external frame of a credit sequence.

Interestingly, Morricone also scored a scene in the film *Mission to Mars* (Brian de Palma, 2000) in a way which suggests some affinity with *The Thing*: a slow bass guitar musical heartbeat is heard during an asteroid attack in space, clearly expressing the fear of the characters, for whom an asteroid hit would be catastrophic. Ironically, this affinity

with *The Thing* suggests that the heartbeat is not merely expressive but also emanating from a malevolent alien life form, orchestrating the attack. Yet this is not the case, and ultimately this same heartbeat rhythm is heard at the end of the film to signal new birth in the Universe. Indeed, *Mission to Mars* reminds us that cinematic-fear is not the only quasi or fictional emotion to which a musical heartbeat can contribute in the cinema. It is also possible that a musical heartbeat, placed in the appropriate context, can contribute to the imagining of the excitement produced by romantic love, for example. The associated physiological symptoms could be stimulated by the awareness of the body in the same way as with cinematic-fear.

As the examples discussed above demonstrate, though, the heartbeat hypothesis stresses most clearly the importance of physiological awareness to fear states - and thus to fictional fear states in general and cinematic-fear states in particular. By invoking bodily sounds, which may also include the sound of the human voice and intimate 'wet' sounds in addition to heartbeats,⁵⁵ film music and sound can draw our attention (consciously or unconsciously) to the fragility of our own bodies, allowing us to simulate far more effectively the fictional fear felt by the film's protagonists. In that sense, music's use in *The Thing* is particularly appropriate in underlining the film's themes of bodily possession. Such a mechanism evidently relies on other contextual information in the sound and visuals, and to a lesser degree perhaps on an association of ideas from other multimedia examples. As a cinematic code, though, it is not only fairly widespread but also, I would argue, fairly widely understood. It thus serves to remind us that music's relationship with the body is not only important to how we choose to perform and talk

⁵⁵ John Williams's score for *War of the Worlds* includes a number of human screams in the underscore that are designed to "humanise the experience." See "Scoring *War of the Worlds*" on the Region 2 DVD release of the film, 03:50.

about performing music,⁵⁶ but that it also has an impact on the games of make-believe we play in the cinema when listening to it, and the emotional response we may have while doing so.

Conclusion: wider implications for musicology and film music theory

Nor is this idea of fictional emotions limited to the cinema: heartbeats are used throughout opera and concert music repertoires for similar expressive effect, and our reactions may also be modelled using the heartbeat hypothesis. Examples in opera are usually associated with love and include the heartbeats found in Tchaikovsky's *Eugene Onegin* (Tatyana's letter scene), Cimarosa's *Due supposti conti I* (in the duet 'Nel veder quell tuo sembiante'), and Pergolesi's *Flaminio* (in the act 3 duet 'Per te ho io nel core' where Checca sings "tippitì, tippitì, tippitì," and Bastiano replies "tappatà, tappatà, tappatà"). The heartbeat rhythm of Siegfried's death motif, used to powerful effect in the funeral music from *Götterdämmerung*, perhaps bears a closer resemblance to the film examples discussed here. In orchestral music, we might find pertinent examples in the heartbeat ending of Tchaikovsky's Symphony No. 6, Shostakovich's Symphony No. 4, or Richard Strauss's *Tod und Verklärung*. As with the cinematic examples discussed above, these heartbeats can contribute in the context of other representational information - in the text of opera or song, in titles of instrumental works, or in the programmes of tone poems, for example - to the evocation of an imagined feeling. Thus, with the heartbeat accompaniment to the first appearance of the *idée fixe* in Berlioz's *Symphonie Fantastique* (after figure 5), we may report feeling excited partly because we imagine the

⁵⁶ See Bruno H. Repp, "Music as Motion: A Synopsis of Alexander Truslit's (1938) *Gestaltung und Bewegung in der Musik*," *Psychology of Music* Vol. 21 No. 1 (1993): 48-72; and Elizabeth Le Guin's *Boccherini's Body: An Essay in Carnal Musicology* (Berkeley: University of California Press, 2006).

protagonist of the symphony to be feeling fictionally amorous. And it is the heartbeat that gives us this idea in the context of the symphony's programme. We may recognise cognitively that the heartbeat expresses excitement precisely because of our physiological reaction to it.

What I am suggesting, then, is that the two sides of the debate concerning music's ability to express versus its propensity to emote may both be correct in parts. Music undoubtedly does cause reported feelings of emotions and physiological changes, something that cognitivists like Kivy cannot deny; however, there can be little doubt that these responses are not caused by real-world emotions. Like cinematic emotions, they are fictional, and can be thought of as ascribable to an imagined fictional character - whether a protagonist in a programme of our own invention, an operatic character, or an intra-diegetic narrator figure with which we might align a constructed version of the composer, for example. In that sense, music is indeed, as Kivy claims, only expressive of emotion, but in many people it also leads to the *imagining* of emotions in the same way that it does in other forms of fiction, to the extent that they might believe their emotional responses to be genuine. In Walton's formulation, music is a prop in a game of make-believe and, as such, there may be no fiction at all until we listen.⁵⁷ In a supposedly 'autonomous' work with no programme or text, then, we may imagine both the character and their emotional response to a fictional object.⁵⁸ Undoubtedly, musical heartbeats are particularly useful in expressing emotions in non-cinematic music. Whether or not we, as listeners, simulate the emotion that we believe the heartbeats to be expressing, and the extent to which that

⁵⁷ See Walton, *Mimesis as Make-Believe*, 336–341.

⁵⁸ Similar claims for music's fictional status have been made by Donald Callen, "The Sentiment in Musical Sensibility," *Journal of Aesthetics and Art Criticism* Vol. 40 No. 4 (Summer 1982): 381–393; and Malcolm Budd, "Music and the Communication of Emotion," *Journal of Aesthetics and Art Criticism* Vol. 47 No. 2 (Spring 1989): 129–137.

simulation is persuasive, may be partly a result of the effect described by the heartbeat hypothesis. Music, though it may lack representational content in the traditional sense of the word, can thus be considered a fictional art in its relationship with emotion.

The heartbeat hypothesis above and its preceding discussion also have implications for film music theory that require stating explicitly, by way of conclusion; not only does this approach place a greater emphasis on cognitive models of interpretation, and suggest an embodied musical listening may play a large part in our emotional connection with film music, but it also implicitly challenges Gorbman's theory by questioning the very notion of nondiegetic music, a philosophical leftover from silent-era cinema aesthetics, perhaps, when a nondiegetic source for the music was visible to the spectator. If all the 'emotional' music that we hear in a film can be located within the narrative world presented to us, then our understanding of that music changes: no longer would we consider it an external, interpretative or manipulating force, considered subordinate (or indeed subversively superior) to other visually- or aurally-constructed narrative concerns, and of separate status to diegetic sound; but rather we could see it is a key component in a complete audio-visual world, of vital importance both to the construction of the fiction, and to our simulating of fictional emotions. This runs counter to traditional approaches - such as Adorno and Eisler's book, which advocated the idea of a separate, distancing voice modelled after a Brechtian *Verfremdungseffekt*. Indeed, contrary to some prevailing film music models,⁵⁹ many of us experience film music in a far from subliminal way, a factor recognised and exploited by a multi-million dollar

⁵⁹ Donnelly's recent work refers to film music functioning subliminally as a "system of control," (Donnelly, *The Spectre of Sound*, 1, 4) despite arguing elsewhere that film music also works through "conscious and semi-conscious linguistic codes." (88). Similarly, Stilwell writes that "musicians...may register the music just as subliminally as anyone else: actually *listening* to a film score is a feat demanding considerable concentration." Stilwell, "Sound and Empathy," 183n2.

soundtrack industry. This is also borne out by the habits of those fans who choose to remake shortened versions of Hollywood films for broadcasting on YouTube. These ‘sweded’ movies (a term coined by the 2008 Michael Gondry film *Be Kind Rewind*) often feature crudely sung versions of a film’s music—in some cases reproducing cues that might otherwise be dismissed as ‘unheard.’⁶⁰ Clearly, film music is sometimes noticed as much as visuals and sound design by the cinema-going public, and can be important in defining a fan’s emotional experience of a film.⁶¹ Where the world of film studies is perhaps understandably reluctant to overturn the visual bias of its discipline in this regard, musicology may confidently step into the breach, using models like the heartbeat hypothesis to better explain sound and music’s role in constructing the cinematic object.

⁶⁰ See, for instance, the rather amusing “Star Wars (Sweded): A Cardboard Hope” (http://www.youtube.com/watch?v=qEWhrjYg_o) accessed 20 April 2008. We might also invoke *Blue Harvest*, Family Guy’s affectionate nod to *Star Wars*, in which Peter Griffin (playing Han Solo) cannot resist singing along to John Williams’s cue “Here They Come” as he battles TIE fighters.

⁶¹ See also Peter Franklin, “The Boy on the Train, or Bad Symphonies and Good Movies: The Revealing Error of the ‘Symphonic Score’” 13–26 in *Beyond the Soundtrack: Representing Music in Cinema* ed. Daniel Goldmark, Lawrence Kramer, and Richard Leppert (Berkeley: University of California Press, 2007).