

A series of overlapping, irregular black lines forming a complex, abstract geometric pattern in the upper left quadrant of the page. The lines intersect to create various polygonal shapes, some of which are nested within others, creating a sense of depth and movement.

# MUSIC – SIGNALLING OR REPRESENTING?

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# PLAN

Introduction

Musical meaning in philosophy

Musical meaning in cognitive sciences: syntax and semantics

Musical meaning and other cognitive functions

Evolutionary approaches

Signals vs. representations

Problems & perspectives



# INTRODUCTION

Can music mean?

What would it mean?

What could it mean that music means?

Can music and language be related?

# MUSICAL MEANING IN PHILOSOPHY

## **Can music mean?**

No (sensual pleasure, extreme formalism)

Yes

## **Is the meaning of music related to emotions?**

No (e.g. moderate formalism)

Yes (expressivism)

## **How does the meaning of music relate to emotions?**

Represents (cognitivism)

Evokes (emotivism)

## **How does music represent emotions?**

Symbolically

Analogically

Indexically



# MUSICAL MEANING IN PHILOSOPHY (2)

## **Contemporary accounts:**

anti-representationalism and intellectualism (Scruton, 1976)

formalism (Zangwill, 2004)

some music representational (programme), aesthetic representation,

sadness as a musical quality (Kivy, 1980)

symbolism a'la Langer (Guczalski, 1999)

# MUSICAL MEANING IN PHILOSOPHY (3)

Music as a non-discursive symbol of emotional processes (Langer, 1941)

If music has any significance, it is semantic, not symptomatic. Its "meaning" is **evidently** not that of a stimulus to evoke emotions, nor that of a signal to announce them; if it has an emotional content, it "has" it in the same sense that language "has" its **conceptual content**—*symbolically*. It is not usually derived *from* affects nor intended *for* them; but we may say, with certain **reservations**, that it is *about* them. Music is not the cause or the cure of feelings, but their *logical expression*: though even in this capacity it has its special ways of functioning, that make it incommensurable with language, and even with presentational symbols like images, gestures, and rites.

Because the forms of human feeling are much more congruent with musical forms than with the forms of language music can *reveal* the nature of feelings with a detail and truth that language cannot approach. This peculiar articulateness of

# MUSICAL MEANING IN PHILOSOPHY (4)

Back to expressivism:

Thus the most direct [method of knowledge] is that for which music expresses the stirrings of the will itself, but the most indirect that of the concepts denoted by words. . . . From its own resources, music is certainly able to express every movement of the will, every feeling; but through the addition of the words, we receive also their objects, the motives that give rise to that feeling. . . . For only the passions, the movements of the will, exist for it [music], and, like God, it sees only the heart. . . .

But at the same time, all the human passions and emotions speak from this symphony; joy, grief, love, hatred, terror, hope, and so on in innumerable shades, yet all, as it were, only in the abstract and without any particularisation; it is their mere form without the material, like a mere spirit world without matter.

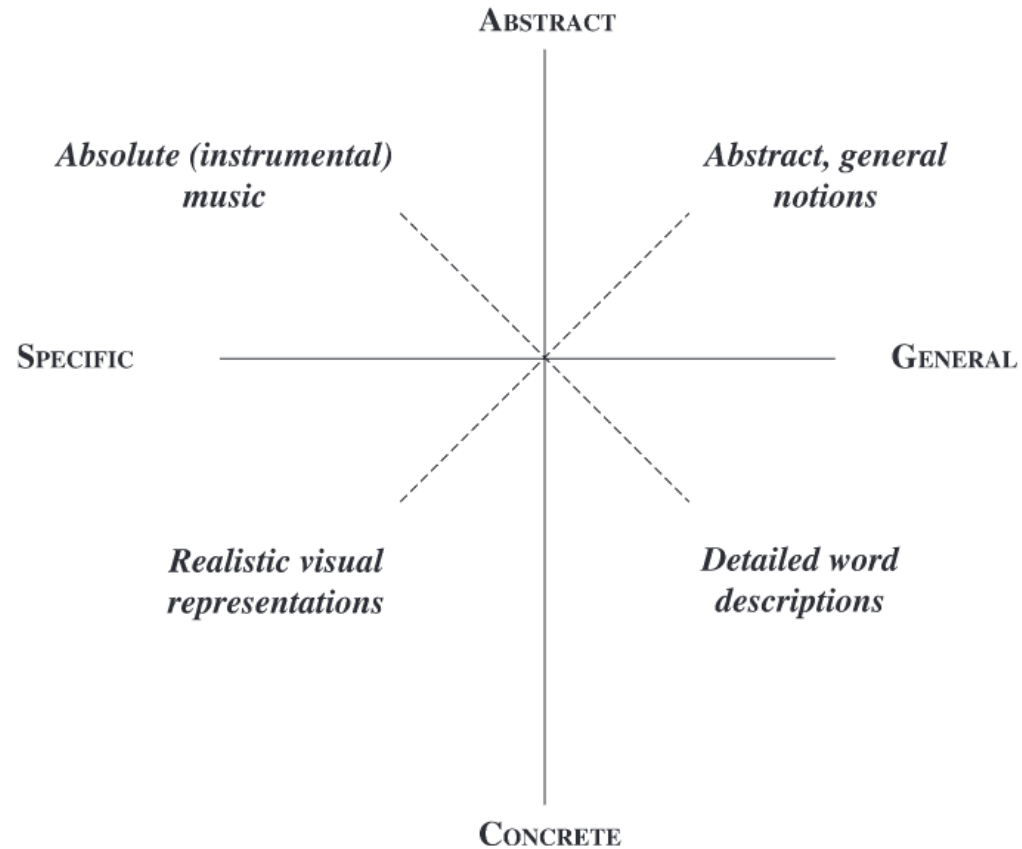
Schopenhauer, *The World as Will and Representation*

I shall use a flowing stream as an illustration. It is beyond human art to depict in words meant for the eye the thousands of individual waves, smooth and rugged, bursting and foaming, in the flow of a mighty river—words can but meagrely recount the incessant movements and cannot visibly picture the consequent rearrangement of the drops of water. Just so it is with the mysterious streams in the depths of the human soul; words mention and name and describe its flux in a foreign medium. In music, however, the stream itself seems to be released.

W. H. Wackenroder, *Phantasien über die Kunst* [1799]. Quoted in Oskar Walzel, *German Romanticism*

# MUSICAL MEANING IN PHILOSOPHY (5)

Can music both express and symbolise (emotions)?



musical expressiveness is connected with music's being an iconic symbol of feelings, which amounts to no more than saying that music does in fact resemble some aspects of feelings—be it their external expressive manifestation in human behaviour or some sort of internal aspect

Guczalski, 2005



# MUSICAL MEANING IN PHILOSOPHY (6)

## **Problems:**

What is musical meaning and representation?

What is music's relation to emotions?

How can musical form be meaningful?

What are aesthetic emotions in music?

## **Solution?**

Musical representation as a type(s) of mental representation  
understood mechanistically, structurally and teleosemantically

# MUSICAL MEANING IN COGNITIVE SCIENCES

## **Cognitive Neuroscience**

Syntactic musical „meaning” (SSIRH, structure building and expectation)

Semantic meaning(s)

Emotion: induction, representation or none?

## **Evolutionary Psychology**

Musical meaning – functional explanation of (sources of)  
musicality: „auditory cheesecake”, adaptation, exaptation,  
fitness signaling, communication, social-cultural...)

**Embodied Approaches** (eg. musical affordances)

**Proximate vs. Ultimate explanations**

# COGNITIVE NEUROSCIENCE: MUSICAL SYNTAX & SEMANTICS

Structural integration in language and music: Evidence for a shared system (Fedorenko, Patel, 2009)

## Shared Syntactic Integration Resource Hypothesis

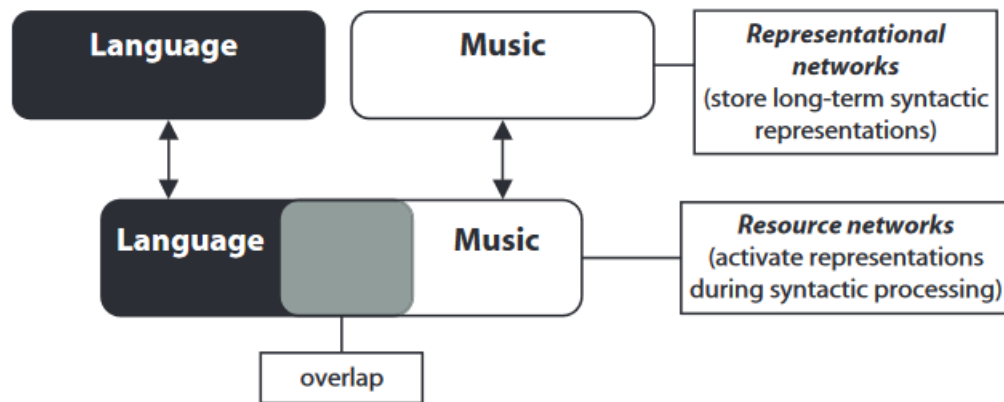
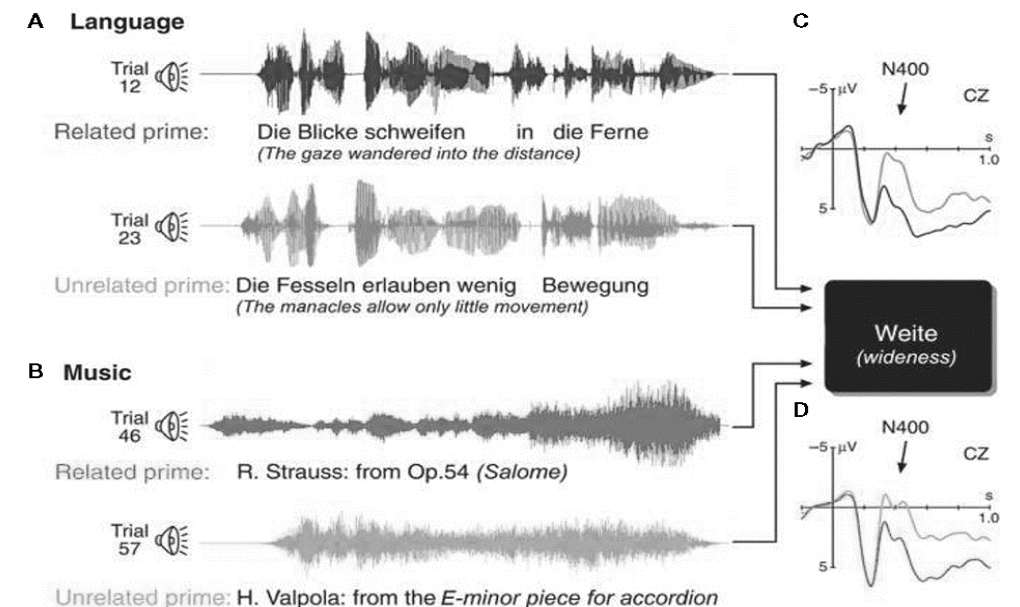


Figure 1. Schematic diagram of the functional relationship between linguistic and musical syntactic processing (adapted from Patel, 2008).

Semantic incongruity:  
**Music elicited N400 ERP**, similarly to language  
(Koelsch et al., 2004)



# COGNITIVE NEUROSCIENCE (2): MUSICAL SYNTAX & SEMANTICS

Typology of musical meaning (Koelsch, 2013)

**Table 10.1** Synopsis of the dimensions of musical meaning.

extra-musical			intra-musical	musicogenic		
iconic	indexical	symbolic		physical	emotional	personal

# COGNITIVE NEUROSCIENCE (3): EMOTION

Representation or induction of emotion (Juslin, Vasfjäll, 2008)

<b>Nature of induction process</b>		<b>Characteristic</b>	
<b><i>Mechanism</i></b>	<b>Induced affect</b>	<b>Induction speed</b>	<b>Degree of volitional influence</b>
Brain stem reflex	General arousal, unpleasantness versus pleasantness (Berlyne 1971; Lane 2000, p. 362; Västfjäll, in press)	High (Goydke et al. 2004)	Low (Foss et al. 1998; Joseph 2000)
Evaluative conditioning	Basic emotions (Joseph 2000; LeDoux 2002; Olatunji et al. 2005)	High (LeDoux 2002)	Low (Martin et al. 1984; De Houwer et al. 2005)
Emotional contagion	Basic emotions (Juslin & Laukka 2003; Lane 2000, pp. 361–63; Laird & Strout 2007)	High (Dimberg & Thunberg 1998)	Low (Neumann & Strack 2000; Dimberg et al. 2002)
Visual imagery	All possible emotions (Lane 2000, pp. 361–63)	Low (Bunt 2000; Decety & Jeannerod 1995)	High (Bonde 2006; Farah 2000; Kosslyn 1994; Larson 1995)
Episodic memory	All possible emotions, though especially nostalgia (Juslin et al., submitted; Wildschut et al. 2006)	Low (Conway & Holmes 2005, p. 526)	Medium (Conway & Holmes 2005; Tulving 1983)
Musical expectancy	Surprise, awe, pleasure, “thrills,” disappointment, hope, anxiety (Meyer 1956; Huron 2006)	Low (Janata 1995)	Low (Koelsch et al. 2002)

# COGNITIVE NEUROSCIENCE (4): MUSICAL MEANING REVISITED

## Problems:

How to link (integrate or unify) different theories and levels of explanation?

Lack of explanation of other higher processes of music cognition.

- Are N400 correlates enough to think of music as „semantical”
- What about self-related thoughts
- How about spontaneous thinking & music (mind-wandering)
- Emotional/Aesthetical qualities of music

Musical representation as a type(s) of mental representation understood mechanistically, structurally and teleosemantically ?

# EVOLUTIONARY PSYCHOLOGY: ORIGINS AND FUNCTIONS OF MUSIC

- (1) Byproduct
- (2) Social-bonding
- (3) Signalling

- (1) Byproduct
  - (1) Auditory cheesecake – Pinker
  - (2) Other cognitive abilities involved
- (2) Social bonding, eg. replacement of grooming, group stress reduction
- (3) Signalling

# EVOLUTIONARY PSYCHOLOGY: ORIGINS AND FUNCTIONS OF MUSIC

- (1) Byproduct
- (2) Social-bonding
- (3) Signalling

Music as a signal:

(2) Credible signal of:

- (1) Mate quality: handicap? (Miller, 2000)
- (2) Group size/power (Mehr, 2021)
- (3) Parental attention, e.g. due to altricialisation (Cross, 2000, Mehr, 2021)



# EVOLUTIONARY PSYCHOLOGY: ORIGINS AND FUNCTIONS OF MUSIC

- (1) Byproduct
- (2) Social-bonding
- (3) Signalling

Music as a signal:

signal: any act or structure which alters the behaviour of other organisms, which evolved because of that effect, and which is effective because the receiver's response has also evolved  
(Maynard Smith & Harper 2003)

# EVOLUTIONARY PSYCHOLOGY: ORIGINS AND FUNCTIONS OF MUSIC

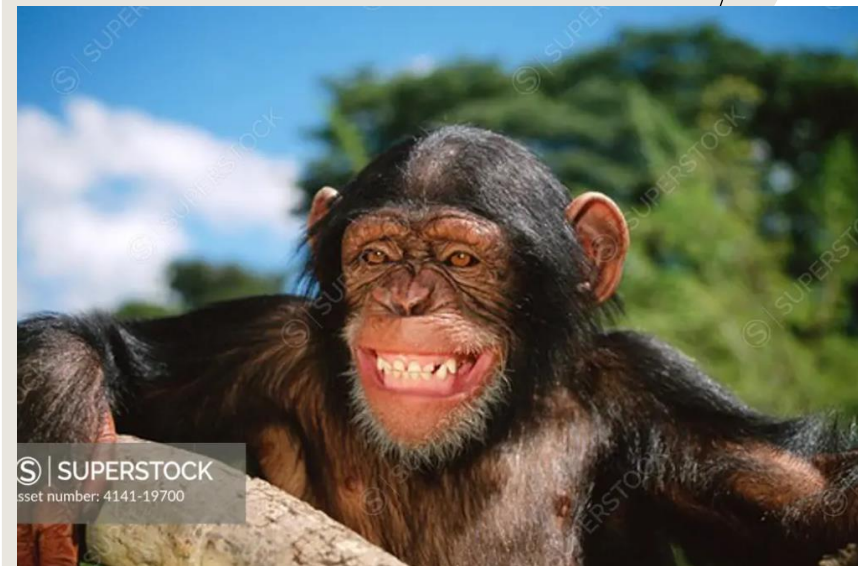
- (1) Byproduct
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Music as a signal:

ECM – emotion communication model

A person feels an emotion (such as happiness), and this causes them to generate an appropriate display (such as smiling). An observer perceives (recognizes) the display and infers that the individual feels happy. If conditions are right, the observer then empathizes or partakes of that same emotion. In this way, a represented or displayed emotion can ultimately lead to an induced or evoked emotion in an observer.

According to Huron, 2015, biologically implausible, ethological approaches necessary



# EVOLUTIONARY PSYCHOLOGY: ORIGINS AND FUNCTIONS OF MUSIC

- (1) Byproduct
- (2) Social-bonding
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Music as a communication system, Cross, 2009:

Cultural-enactive

Motivational-structural



# BACK TO PHILOSOPHY

(OF MUSIC COGNITION).

FUNCTION

## **So, signal or representation?**

“d is G” means functionally that w is F if and only if the function of d is to indicate the state of w, and the realization of this function consists in part in indicating that w is F by virtue of d being G (Dretske 1986, 22).

proper functions are associated with the reproduced or, more generally, duplicated things, certain effects whose antecedents helped to explain the survival of the lineage of these objects through continuous reproduction (Millikan 2011, 111).

It is the proper function of an element (X) of an organism (O) to do what elements of type X did to contribute to the overall fitness (fitness) of the ancestors of O, and what caused the genotype of which X is the phenotypic expression to be selected by natural selection (Neander 1991, 74).



**Pushme-pullyu**

## TELEOSEMANTIC ACCOUNT OF MM?

The “descriptive” element of the function is the sound structure itself (what this structure describes is a separate question), while the “directive” element is the function it fulfills in the listener’s mind and their interaction with the environment. These functions are determined biologically by the evolution of the organism (but perhaps also in the process of cultural evolution). In the case of animal signals, the directive function is necessarily fulfilled, it happens automatically. In humans, fulfilling a specific musical function (e.g. evoking emotions) does not have to (although it can) occur automatically, and may depend on the plan, the “cognitive project” of the organism or the context (e.g. education and type of musical stimulus).

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## TELEOSEMANTIC ACCOUNT OF MM?

I propose to consider the content of such a musical representation (expanding Millikan's definition) as the most general explanation (provided by cognitive sciences) of the functional state of mind that is induced by the musical stimulus in listeners (this explanation, at least at a basic level, would refer to the concept of structural representation). Such an approach would fit into the paradigm of naturalization of mental content and intentionality, where scientific explanations of mental states can be considered as content.

# Musical meaning reconsidered

Musical meaning	_____	Understood functionally within a mechanistic, structuralist, and representationalist account of mind.
Musical representation	_____	Music evokes structural, semantic and emotional representations.
Teleosemantic musical meaning	_____	The teleosemantic approach allows us to capture and explain the multidimensionality of the functions of (different) music (see Koelsch's typology of ZM)
Pushme-pullyu musical representation?	_____	Ultimately (in the etiological version): naturalization of musical meaning



# PROBLEMS AND PERSPECTIVES

Misrepresentation?

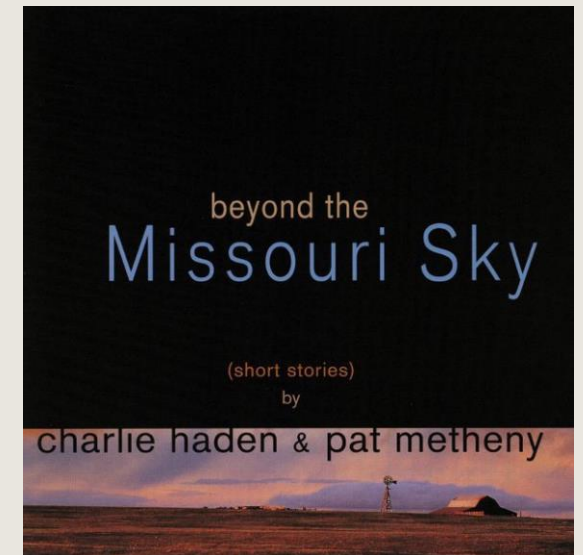
Structural (iconic) representations in the brain?

Accounting for MR using predictive processing without representation?

Proper function specification



THANK YOU FOR YOUR  
ATTENTION!



(Haden, Matheny, 1997)

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