

## Phenomenological music listening and the neuroscience of attention.

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Presentation at the Conference “**Focusing – Listening – Ignoring**”, November 25-27<sup>th</sup> 2021.

Organized by the Centre for Systematic Musicology at Karl Franzens University, Graz, Austria.

<https://www.musau.org/assets/Uploads/OeGMW2021-Programm-online4.pdf>

**First part:** A brief introduction to the method of experimental music listening, developed on the basis of the music phenomenology of the philosopher Don Ihde and the musicologists Thomas Clifton and Lawrence Ferrara. In experimental listening, two people perform phenomenological variations, listening to a short piece of music many times while applying multivariable music-focused and hermeneutical listening strategies.

Music-focused listening is directed by specific questions concerning *temporal features* such as speed, rhythm, pauses, form and subdivisions, *spatial features* such as registers and transparency, and *temporal-spatial features* such as movement, direction, expansion and sound qualities. Hermeneutical listening is guided by cues for interpretation, such as the music’s title, the suggestion of a context, or questions about emotions and expression.

After each listening, the participants describe and notate their first-person phenomenological experience. In a final report, the participants sum up and discuss their observations and reflections.

Experimental listening requires the motivation and perseverance of professional listeners, such as musicians, music therapists, and researchers. For music education, a simple practical progression, called intensive listening, is applicable. Intensive and experimental listening can facilitate the appropriation of music, enhance the consciousness of expressive and structural qualities, promote the discovery of unnoticed musical features and relationships, and evoke associations to the lifeworld of the participants.

As a hint of the method, the audience will listen several times to a very short piece of music, Anton Webern’s Bagatelle for string quartet op. 9 no. 1 (1913), duration 30 seconds.

**Second part:** A brief introduction to neuroscientific investigations of attention in the central nervous system, including the functions of neurotransmitters and cortical networks. Research areas of importance encompass the relationships between attention, emotion, memory and learning; the integration of auditory, visual and tactile sensory qualities; the processes of neural excitation and inhibition; the switching between selective and distributed attention.

The two parts of the talk provide the basis for a discussion of possible relationships between the neurology of focused attention and the performance of phenomenological variations in music listening.

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Conference Listening - Focusing - Ignoring  
Karl-Franzens Universität Graz  
25-27. November 2021

Phenomenological music listening  
and the Neuroscience of attention  
A brief introduction

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Part one  
Music Phenomenology

*Open, Focused and Hermeneutical  
Music Listening*

Phenomenology is

*Active investigation of  
the experienced world*



*Description  
of the first-person experience*

*Reflection  
on the process of experience*

## Music phenomenologists:

Thomas Clifton (1935-78). The enthusiastic discoverer  
*Applied music phenomenology: theories and investigations*

Lawrence Ferrara (\*1949). The pragmatic researcher  
*Application of open, focused and hermeneutical listening*

Don Ihde (\*1934). The reflecting philosopher  
*Practice and rules for phenomenological investigation*

Clifton 1983; Ferrara 1984

Ihde 2007, 2012

Background:

The phenomenological philosophy of

Husserl (1859-1938)

*Logische Untersuchungen. Zweiter Theil.* (1901)

*The Phenomenology of Internal Time Consciousness* (1928/1964)

Heidegger (1889-1976)

*Being and Time* (1927/1962)

Merleau-Ponty (1908-61)

*Phenomenology of Perception* (1945/2002)

First phenomenology  
(Husserl)

Music-focused description:  
*Presence, structure,  
characteristic features*



Second phenomenology (Heidegger, Merleau-Ponty)

Hermeneutic interpretation:

*Lifeworld, existence, memory, body, emotion*

Important: *Intersubjective verification*

Clifton 1983, Ferrara 1984, Ihde 2007





Ferrara 1984

Phenomenological variations:

I. Open listening:

*Listen without deliberate focus*

2. Directed by questions and tasks:

Music-focused listening:

*Listen for musical features*

Hermeneutical listening:

*Listen in context*

*Listen for emotion*

## Simple intensive phenomenological listening:

*Listen seven times  
to a short piece or excerpt of music  
employing phenomenological variations*

Classroom teaching includes  
dialogues between listenings,  
summing up and discussions  
of the various experiences

Christensen 2012



Webern:  
Bagatelle for string quartet  
op. 9 no.1, 1913 (0'30)

*Initial open listening without focus:  
Listen twice without interruption*

# Webern: Bagatelle

*Music-focused listening:  
Listen for foreground and background*

# Webern: Bagatelle

*Hermeneutical listening:  
Listen to the music as voices*

# Webern: Bagatelle

*Hermeneutical listening:  
Listen for emotional expression*

Webern: Bagatelle  
*Final open listening*



*The Emerson Quartet*

## Experimental listening

For two music professionals: A and B

- 1) *A (the author) conducts a number of preparatory listenings, notating questions, listening tasks and cues  
(Webern example: listening 14 times)*
- 2) *A and B conduct a sequence of listenings,  
performing phenomenological variations*

*A decides the progression (with improvisations)  
B provides answers and descriptions. A notates.  
(Webern example: listening 28 times)*

For detailed documentation, see Christensen 2012



Experimental listening, Webern:

Examples of music-focused phenomenological variations

Spatial focus: *Listen for foreground and background.  
Listen for the space between high and deep tones.*

Temporal focus: *Listen for rhythm and pulse versus  
unrelated events; Listen for coherence versus interruptions.*

Spatial-temporal focus: *Listen for sections and subdivisions.  
Listen for gestalts versus fragments.*

Sound qualities: *Listen for the qualities of the single tones.  
What are the particular qualities of the deep tones?*

## Experimental listening, Webern: Examples of hermeneutical phenomenological variations

*Hear the music as voices*

*Hear the music as gestures and body movement*

*Hear the music as persons acting on a scene*

*Listen for emotional expression*

## Don Ihde's rules for experimental phenomenology:

1. *Attend to the phenomena of experience as they appear*
2. *Describe, don't explain*
3. *Perform phenomenological variations*
4. *Regard all experienced phenomena as equally real*
5. *Include intersubjective verification*

Ihde 2012

## Phenomenological Investigation

*Discovers unnoticed  
aspects of the world*

*Uncovers the wealth  
and complexity of  
human experience*

*Provokes the sense  
of wonder*



Merleau-Ponty 2002  
Clifton 1983; Ihde 2007

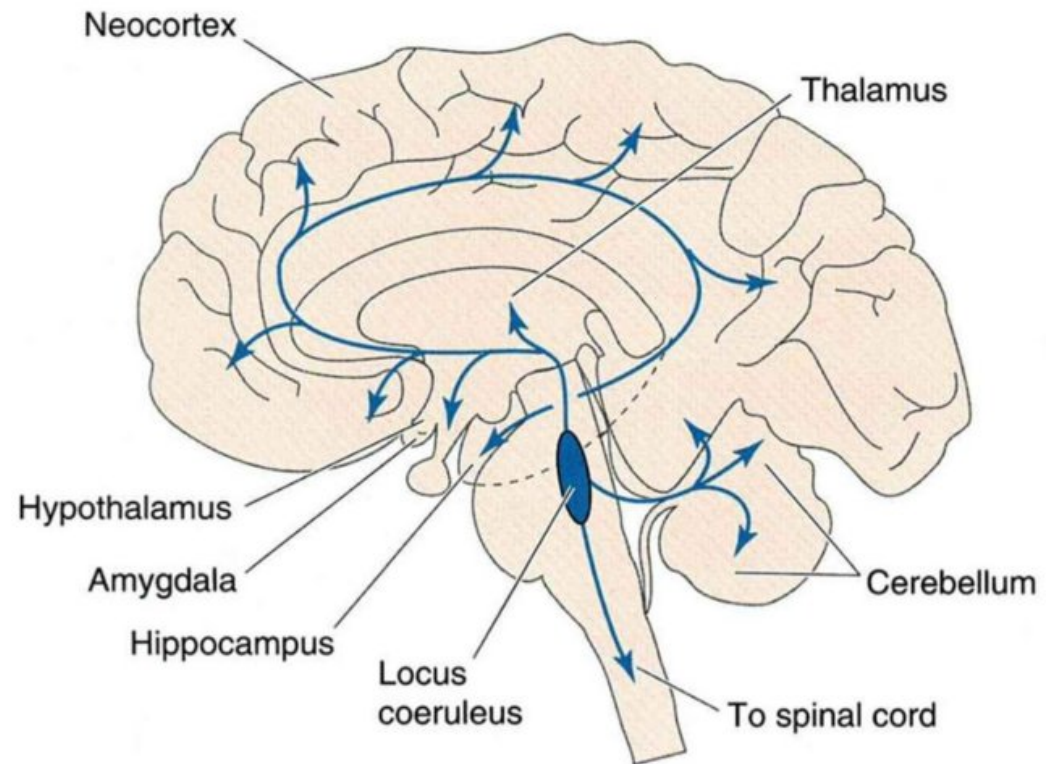
Part two  
The neuroscience of attention

*and suggested correspondences to  
open, focused and hermeneutical listening*

# A neuromodulator (neurotransmitter) important for attention: *Norepinephrine*

is produced in the  
*Locus coeruleus*  
area in the  
brainstem

and projected  
to nearly all  
brain regions



Lin & Vartanian 2018

Two kinds of attention, *selective* and *distributed* are regulated by the production of Norepinephrine (NE) in the Locus coeruleus (LC)

In *selective attention* related to a task, the LC is activated in the *phasic mode*, releasing NE in short-duration, rapid bursts

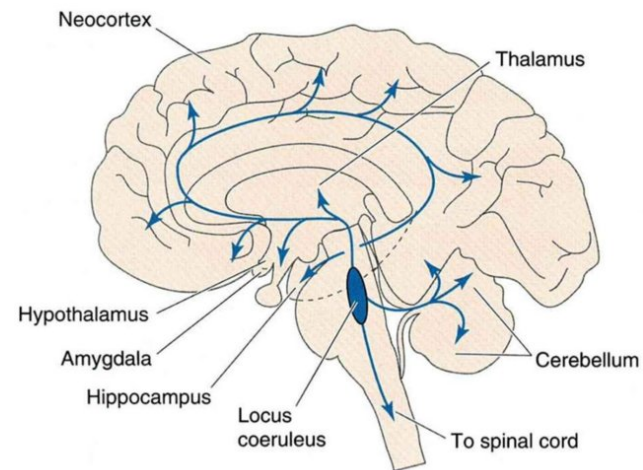
In *distributed attention* unrelated to a task, the LC is activated in the *tonic mode*, releasing NE in intrinsic, ongoing firing

Aston-Jones et al. 2005  
Lin & Vartanian 2018

Suggestion:

*Selective attention* related to a task  
corresponds to *focused music listening*

*Distributed attention* unrelated to a task  
corresponds to *open music listening*





Brain networks for *selective and distributed attention*:

A dorsal (upper) network

directs attention to focus on a selected goal

A right-hemisphere ventral (lower) network

directs attention to stimuli outside the focus

Corbetta et al. 2002, 2008

Janata et al. 2002

## Focused attention



The dorsal network  
(yellow-orange) is activated  
The ventral network  
(blue) is deactivated

## Unfocused attention



Both networks are activated

Corbetta et al. 2008

Attention has implications  
for other functions

*Neural inhibition:*

Selective attention implies  
the excitation of particular sensory neurons  
and the inhibition of competing neurons

*Variable focus of attention  
is the basis of phenomenological variations*

Noonan et al. 2018; Brodal 2016  
van Moorselaar & Slagter 2020

*Working memory:*

Selective attention  
influences working memory performance

*Focused listening  
is the basis of memorisation*

Corbetta & Shulman 2002  
Gazzaley & Nobre 2012

Other functions influence attention

*Emotion:*

Emotionally  
significant stimuli  
may guide attention  
and enhance  
perception

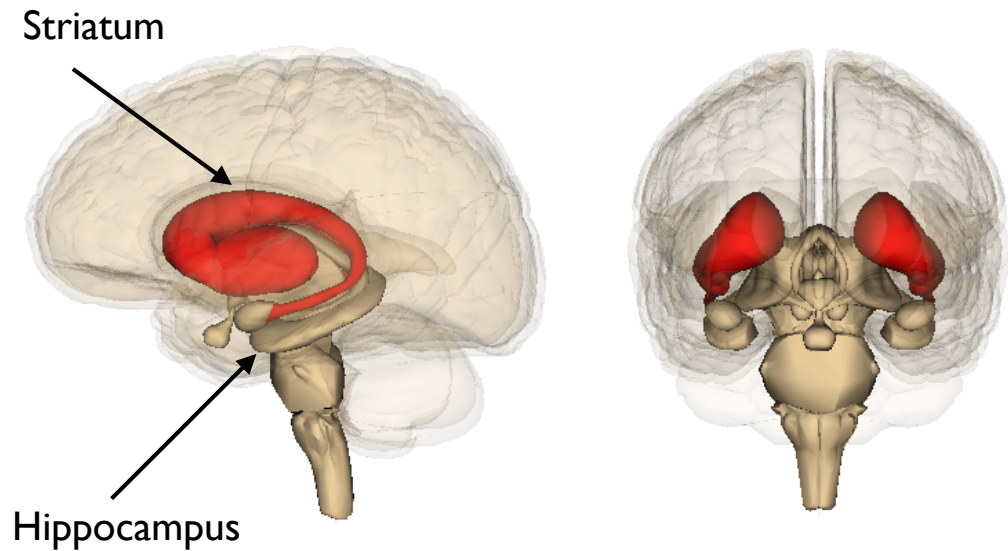


*Hermeneutical listening  
is related to musical expression and emotion*

Domínguez-Borràs & Vuilleumier 2013  
Trost et al. 2011

*Long-term memory:*

Multiple memory systems facilitate attention



*The hippocampus*  
facilitates attention related to context memory

*The striatum*  
facilitates attention related to remembered rewards

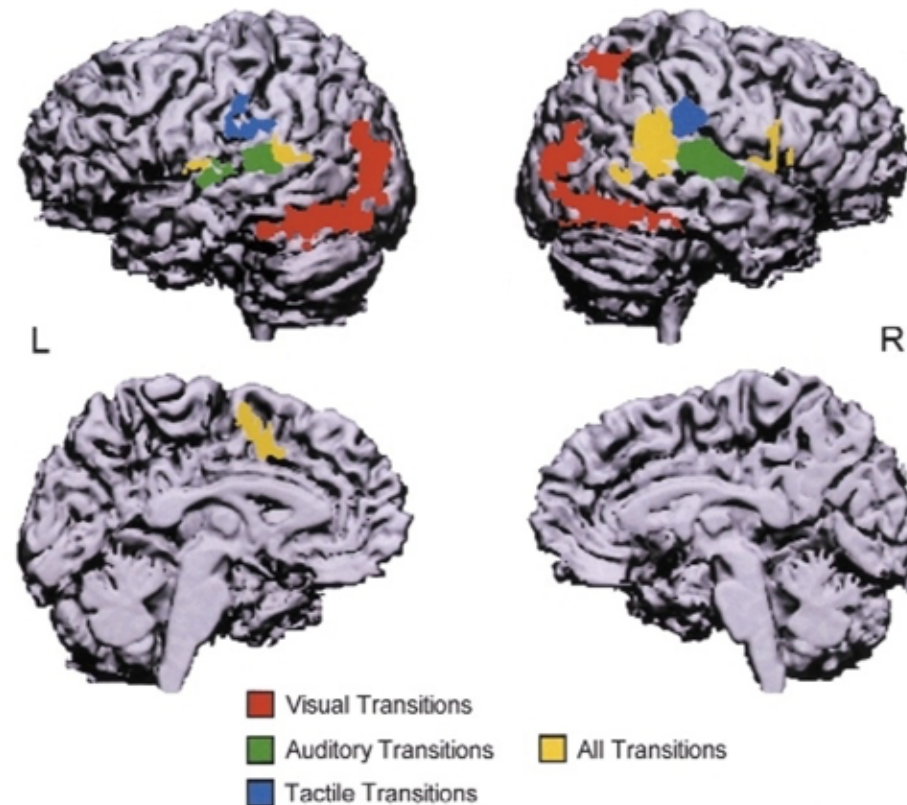
*Hermeneutical listening is related to  
context and personal memories* Goldfarb 2016



A multimodal network  
for *involuntary attention* permits sensory integration  
of auditory, visual and tactile events

*Suggested  
correspondence:  
open listening*

This network  
encompasses  
frontal, medial,  
temporoparietal  
and insular  
cortical areas



Downar 2000

Summing up:

*The procedures of phenomenological music listening  
correspond to particular investigations  
in the neuroscience of attention*

Happy new ears!



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