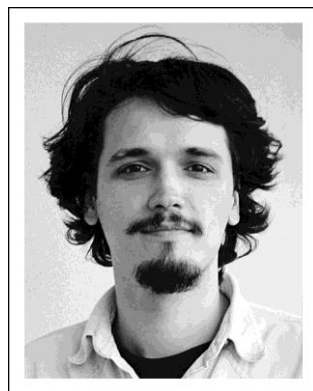


**ORGANIZATION AND ANALYSIS OF
ENTHOMUSICOLOGICAL MATERIALS**
*Reconsideration of Comparison, Classification and Evolution
as Methods and Purposes of Research
in the Context of Electronic Ethnomusicological Corpora*

Ph. D. Candidate THEODOR CONSTANTINIU
"Gheorghe Dima" Music Academy of Cluj-Napoca

Theodor CONSTANTINIU is a Ph.D. student at the "Gheorghe Dima" Academy of Music in Cluj-Napoca. He graduated from the Faculty of Musical Performance (specialization Violin) and then completed his Master's studies at the Theoretical Faculty (specialization Musicology) at the same institution. Currently he is preparing a Ph.D. thesis on the possibilities of automated analysis of the electronic Romanian Folksong Database. His areas of interest include ethnomusicology, computational musicology, music cognition, the relationship between ethnomusicology and political ideologies.



ABSTRACT

The present study aims to discuss the utility of the corpus as an instrument of knowledge, particularly in ethnomusicology, where it serves as a new form of knowledge organization. The study also undertakes to analyse three of the main points of focus of ethnomusicological research: comparison, classification and evolution. The analysis includes both the conceptual foundations of these lines of research (historical origin, the various meanings or uses they have had over time), and their use in Romanian ethnomusicology, to finally mention some of the most promising approaches of comparison, classification and evolution in the international context of the use of electronic musical corpora.

Keywords: electronic corpus, automated analysis, comparison, classification, evolution.

The cybernetic revolution that started a few decades ago enabled the emergence of new areas of research such as computational musicology or *music information retrieval* (MIR). This new scientific context opens up vast horizons for both composition and musical analysis. One of the possibilities opened up by automated analysis is that of using musical corpora. Though not as comprehensive

as the linguistic ones, these corpora enable the analysis of huge amounts of data, otherwise unmanageable by the ordinary researcher. Whether they consist of pop music pieces, Western art music or simply ethnomusicological materials, electronic corpora allow up-to-now unimaginable amounts of data to be retrieved and analysed. The present study aims to discuss the utility of the corpus as an instrument of knowledge, particularly in ethnomusicology, where it serves as a new form of knowledge organization. The study also undertakes to analyse three of the main points of focus of ethnomusicological research: comparison, classification and evolution. Although not all belong to the same epistemological category – comparison being a research tool, classification a logical operation, and evolution a process related more to the living world – all three have been constant preoccupations of the specialists in the field. The analysis includes both the conceptual foundations of these lines of research (historical origin, the various meanings or uses they have had over time), and their use in Romanian ethnomusicology, to finally mention some of the most promising approaches of comparison, classification and evolution in the international context of the use of electronic musical corpora. Given the considerable length of this paper, its text has been divided into two parts, with the latter to be published in the next issue of the journal.

1. Between encyclopaedia and archive: corpus as a way of organizing knowledge

Mapping cognition or mapping knowledge are two of the intellectual challenges perpetuated since antiquity to this day. Regarding knowledge, Aristotle's *Categories* represented a first systematic treatment of reality, in which the ten categories defined by the philosopher regulate the ways in which a predicate can be related to its subject. Starting from Aristotle's rules on formulating a definition (given the division of categories into genera and species, the definition is formulated by relating the proximal genus and the specific difference), his commentators of the Late Antiquity (especially Porphyry) aimed at defining any object of the real world in the form of a tree, in which the subject of the definition is gradually distilled from the most general genus (*genus generalissimum*) to the most specific species (*speciae specialissimae*), below which there are only the individual representatives of that species (primary substances). It is in this model of the tree of substances that the idea of a dictionary structure of definition originates.¹³³

Umberto Eco places the encyclopaedia – viewed as a general representation of the world – in opposition with the dictionary – regarded here as a model of general representation of knowledge (knowledge manifested through

¹³³ Umberto Eco, *De la arbore spre labirint. Studii istorice despre semn și interpretare*, translated by Ștefania Mincu, Editura Polirom, Iași, 2009, p. 10.

language). These two, i.e. dictionary and encyclopaedia, are rarely found in their “pure” form (according to Eco, a pure dictionary would be this *Arbor Porphyriana*), as dictionaries, in their printed form, most often comprise, besides definitions, encyclopaedic information as well.¹³⁴ In point of fact, “an encyclopaedia always relies for its organization on a tree – whose model is invariably, on a more or less conscious level, that of the binary subdivision of a Porphyrian tree.”¹³⁵

Designed as a comprehensive repertory of a massive amount of knowledge and constantly seeking to combine exhaustiveness with selectivity (not an all-encompassing library, but rather a compact one), an encyclopaedia has its own characteristics. Behind a superficial discontinuity, due to the great number of independent entries arranged alphabetically or based on conceptual, thematic criteria, encyclopaedia supposes a deep, albeit floating continuity, produced by the free association that can be made between any of its entries. Encompassing a dizzying array of topics and issues, with many texts accompanied by various kinds of diagrams, illustrations, maps, statistics, plans, charts or tables (Leibniz had had the idea of an *Atlas Universalis*, which would contain various maps and tables, from geography, astronomy and topography, to heraldry, genealogy, music, architecture, pharmacology or agriculture), encyclopaedia can be viewed as the printed equivalent of the idea of a museum, considered in turn the physical manifestation of an encyclopaedia.¹³⁶

Viewed from these two perspectives, i.e. that of dictionary and that of encyclopaedia, the (electronic) ethnomusicological corpus is rather an ambivalent entity, whose characteristics allow it to be close to both initiatives, but make a clear-cut classification into a single category impossible. As an expression of a particular type of knowledge or, rather, the embodiment of a cognitive process, the song (in this case coming from rural, traditional cultures), as an object with its own characteristics, conveys its own meanings to the observing/listening subject (which meanings are, however, non-symbolic, non-verbal; musical notation, whenever it occurs, describes it only in terms of its acoustic characteristics, without being a symbol of its meanings), a path along which the song acquires the required (albeit perhaps not sufficient, as in the case of language) consistency of a dictionary definition. As a social and cultural act, however, the song most certainly represents one of the important artifacts of a culture, and therefore its presence, or that of music in general, is indispensable in any encyclopaedia. Our study does not aim to

¹³⁴ *Ibidem*, p. 5.

¹³⁵ *Ibidem*, p. 27.

¹³⁶ Olga Pombo, “Leibniz and the Encyclopaedic Project”, in **La Actualidad de Leibniz. Actas del Congreso Internacional Ciência, Tecnologia Y Bien Comun:** (València, 21-23 Marzo de 2001), Editorial de la Universidades Politecnica de Valencia, Valencia, pp. 1-3.

undertake an analysis of songs in terms of music cognition, which could enable the formulation of the objective conditions necessary for the assimilation, reproduction and reception of a certain type of music, but rather attempts a description of the perception of traditional music as a socio-cultural product. Using modern means of investigation, our research is nevertheless in line with the traditional themes of ethnomusicology such as the comparison of musical materials and the development of a classification system and of the evolutionary lines thereof, which would justify the effort of delving deeper into the distinction between corpus and encyclopaedia.

To detail the concept of encyclopaedia, we will return to Umberto Eco, who outlines a brief historical evolution of the encyclopaedia from Antiquity to its contemporary metamorphoses. From the first examples of the Antiquity (Varro, *Rerum divinarum et humanarum antiquitates*; Pliny the Elder, *Historia Naturalis*), through those of the Middle Ages (Isidore of Seville, *Etymologies*, *Physiologus* by Anonymous or Bartholomeus Anglicus with his *De proprietatibus rerum*) and all the way up to the ambitious project of the Enlightenment, *L'Encyclopédie*, encyclopaedias can be characterized as having a high degree of heterogeneity, but also a precarious organization (even chaotic, if viewed from a modern perspective).¹³⁷ Admitting the fact that pre-modern encyclopaedias look like “a mere accumulation of haphazard information”, Eco proposes the thorough examination of the indices of these works, to demonstrate the very opposite.¹³⁸ Most mediaeval encyclopaedias are organized in descending order, from God and the celestial hierarchies down to the elements and tools (which should not surprise us, since the purpose of encyclopaedias was, at that time, a hermeneutic one, i.e. that of explaining how Scriptures should be understood). Later, in *Novum Organum* (1620), Francis Bacon drew up an ideal index, which includes, in a logical order, the celestial bodies, atmospheric phenomena, the earth, the four elements, natural species, and finally man, his diseases and related remedies, equitation and games.¹³⁹ In his “Preliminary Discourse” to the *Encyclopédie* (structured alphabetically), D'Alembert summarizes the permanent tension that had existed between the model of the tree and that of the labyrinth (throughout the Middle Ages and the Renaissance, encyclopaedias continued to draw inspiration from the organization of Porphyry's tree), while emphasizing the flexibility and multiple perspectives that reside in the latter: “We can thus imagine as many different systems of human knowledge as there are worldmaps; and each of these systems

¹³⁷ Such an (apparent) disorder, found in a Chinese encyclopaedia, is the starting point of Michel Foucault's book, *The Order of Things*.

¹³⁸ Umberto Eco, *op. cit.*, p. 32.

¹³⁹ *Ibidem*, p. 36.

might have some advantages that others lack.”¹⁴⁰ The metaphor of the labyrinth is also used by Eco to designate the edifice of the universe as it presents itself to the human intellect, with its ambiguous routes and deceptive appearances. For Eco, the labyrinth takes the form of a network, in which every point can be connected to any other point, resulting in a structure in continuous transformation and which can be traversed in different directions.¹⁴¹

Another issue addressed by Eco is the size of encyclopaedias. He proposes the concept of Maximal Encyclopaedia to designate the impossibility of gathering all the human facts and knowledge in the pages of the same work. The idea of such a work was “transformed over the centuries from a utopia of global knowledge into an awareness of the impossibility of global knowledge.”¹⁴² However, to become operable, this virtually infinite Maximal Encyclopaedia can be split into smaller parts, which should be limited to the understanding of a single context/field. These subunits would be represented by the Median Encyclopedia (shared by both the specialists and the common speaker) and by the Specialized Encyclopedias, the complete collection of which would constitute the Maximal Encyclopaedia.¹⁴³

The two aspects of the encyclopaedia discussed above, i.e. its specific way of organization and its dimensions, enable us to draw a correlation between it and the ethnomusicological corpus. Structuring the latter may seem equally tricky and never final, but rather in a constant reconfiguration depending on the angle we look from. Various ordering criteria such as genres, function, geographic location, number of syllables in the lines, date of collection, rhythmic patterns or tonal-modal structures can provide just as many perspectives through which the corpus material, otherwise silent and expressionless, can fit into different forms, gaining each time new contours and reflexes. Each of these criteria of organization can always bring together items of the corpus which until then had never been put together. This leads to the network model described by Eco, in which the items of the corpus can communicate among themselves, in shorter or longer ways, thus weaving an irregular “net” that describes the map of all possible paths in the corpus. By these ordering criteria chosen in the analysis of the musical materials, the corpus rids itself of its apparent inexpressiveness and demonstrates its latent availability for a sophisticated dynamic of the distances and proximities, which facilitates but also compels a reconfiguration of the scientific inquiry. From the perspective of an encyclopaedia, an ethnomusicological corpus actually represents

¹⁴⁰ *Ibidem*, p 46.

¹⁴¹ *Ibidem*, p. 51.

¹⁴² *Ibidem*, p. 48.

¹⁴³ *Ibidem*, pp. 68-69.

a Specialized Encyclopaedia, with a clearly defined field of activity, though unfortunately not exhaustive either (an encyclopaedia of the traditional vocal song should contain all the songs ever sung in Romanian, while also including, according to Leibniz, those that are to be sung in future).

In our attempt to determine the historical antecedents of the corpus we will have to consider, besides the encyclopaedia, the special form of memory conservation which is the archive. An institution of an undeniably old standing, the archive is inexorably linked to the advent of writing. In societies that did not know writing, the depositary role of collective memory (cosmology, mythology, rituals) was exercised by the person or persons who were most advanced in age. For Paul Ricoeur, the archive, a historical enterprise, marks the advent of historiographical operation in writing. "Testimony is by origin oral. It is listened to, heard. The archive is written. It is read, consulted."¹⁴⁴ The archive is that which allows oral testimony to detach itself from itself, from the utterance that encapsulates it, and to create a new individuality in the materiality of the document. This gap that opens up, according to Ricoeur, between the saying and the said of an utterance, allows the latter to pursue a literary career.¹⁴⁵ The relation with the document has always been central to the disciplines that integrate a significant historical dimension in their profile (be it the history of philosophy, of science, of literature, of music, etc.), and for these disciplines, documents have traditionally represented sources of questions, both about the document itself and about the world it had come from or about that it had arrived in. The document was counted upon to enable the reconstruction, albeit partial, of the past from which it originated and which no longer existed. This is the traditional status of documents in Michel Foucault's view, acting as the language of a silenced, but fortunately decipherable voice. Foucault also indicates a recent change of attitude towards this written depository of memory: the questioning of the document. "[...] history has altered its position in relation to the document: it has taken as its primary task, not the interpretation of the document, nor the attempt to decide whether it is telling the truth or what is its expressive value, but to work on it from within [*de le travailler de l'intérieur*] and to develop it: history now organises the document, divides it up, distributes it, orders it, arranges it in levels, establishes series, distinguishes between what is relevant and what is not, discovers elements, defines unities, describes relations."¹⁴⁶ This change in the mode of reception of

¹⁴⁴ Paul Ricoeur, *Memoria, istoria, uitarea*, translation by Ilie Gyurcsik and Margareta Gyurcsik, Editura Amarcord, Timișoara, 2001, p. 201.

¹⁴⁵ *Idem*.

¹⁴⁶ Michel Foucault, *Arheologia cunoașterii*, translation, notes and afterword by Bogdan Ghiu, Editura Rao, Bucharest, 2010, p. 11.

documents is due to the shift of emphasis, as Foucault noted, from continuities (ages, historical periods) to ruptures, thresholds and discontinuities. Starting from the change of perspective according to which documents no longer represent the inert matter of history, the author follows the path of the consequences, redefining history not as that age-old, collective memory, but as that which exists “in a spontaneous or in a consciously organized form”, which are the different types of documents: “History is one way in which a society recognizes and develops a mass of documentation with which it is inextricably linked.”¹⁴⁷

According to Paul Ricoeur, historical knowledge is based on the tripod of trace – document – question. Without the last one, the document – and even the archive as a whole – will be just an amorphous object, devoid of touch with reality. Documents will begin to provide answers only if they receive the right questions, which means that a historian undertaking research in an archive must arm himself with questions, i.e. with the questionnaire.¹⁴⁸ The written testimony is a silent object and an orphan; it needs questions to begin to speak, being, like any other writing, available to anyone able to read, without having a specific addressee; at the same time, testimonies of this sort are orphan because they are detached from their authors, being left in the care of those who are competent to handle them (historians, researchers, archivists).¹⁴⁹ But it is this detachment from its author that allows the written testimony to change its status to that of an archive. On the other hand, Paul Ricoeur himself admitted that “... any plea in favour of the archive will remain in suspense, to the degree that we do not know, and perhaps never will know, whether the passage from oral to written testimony, to the document in the archive, is, as regards its utility or its inconvenience for living memory, a remedy or a poison – *Pharmakon* ...”¹⁵⁰

As in the case of history, ethnomusicology uses the archive as one of its main sources of investigation. The first ethnomusicological archives were established in Vienna, in 1899 (*Phonogramm-Archive*) and in Berlin, in 1900. For ethnomusicology, this type of institutions were like a basin accumulating all the materials collected by researchers (some of whom were even amateurs until the mid-twentieth century), and from where the printed collections or audio recordings were later to be extracted. Whether they consist of folklore materials gathered from all the corners of world, or just of the folklore of a single region or country, the archives of this kind are each a universe in itself. Taking full advantage of the invention of the phonograph and later of the advancements in

¹⁴⁷ *Ibidem*, pp. 11-12.

¹⁴⁸ Paul Ricoeur, *op. cit.*, pp. 215-216.

¹⁴⁹ *Ibidem*, p. 204.

¹⁵⁰ *Ibidem*, p. 203.

audio and video recording technology, the folklore archives are the place where traditional musical cultures can be analysed irrespective of how they were produced, which creates a separation between fieldwork and individual analysis. This way, the archive becomes the equivalent of the natural science laboratory.¹⁵¹ In modern times, when analogue media, such as the phonograph, have been replaced by digital media, the “classic” activities of the archive have been forced to undergo some reconsideration. The digitization process is nevertheless rather cumbersome, requiring significant human and material resources and, furthermore, being prone to certain risks¹⁵² A positive aspect of this process is that of making archives available to the general public, enabling, by recording the musical materials in various audio formats, the dissemination of information that, until recently, was available only to professionals. One example of adaptation to the new technologies is the computerization of the folk music collections of the Institute for Musicology of the Hungarian Academy of Sciences, where, around the mid-90s, an electronic database was created to allow the retrieval of the main types of old Hungarian folk songs, categorized by musical characteristics, geographical data and conditions of acquisition.¹⁵³

Although thus far presented in the shadow of its better-known relatives, i.e. the encyclopaedia and the archive, the corpus has, in turn, a no less relevant history for the present discussion. The term corpus is of Latin origin and its ancient meaning was that of 'body'. However, the working methods with the corpora of modern linguistics date back to the late 13th century of the Latin Middle Ages, when monks devoted to the study of the Bible indexed the words in the Scriptures, to finally create a long list of concordances that included the number and place where these words occurred in the Bible. The final aim of this exegetical practice was to demonstrate that the Bible is a divine and harmoniously achieved message, and not a mere collection of texts. The first such concordance of which we have actual knowledge is *Concordantie Morale*, attributed to St. Anthony of Padua (1195-1231), and based on the Vulgate. This practice continued throughout the centuries, but today the labour on such a work is immensely facilitated by the use of

¹⁵¹ Maurice Mengel, “De la prăfuitele arhive la viitorul digital. Noi provocări pentru etnomuzicologie”, in Laurent Aubert, *Memorie activă. Omagiu lui Constantin Brăiloiu*, translation by Speranța Rădulescu, Editura Martor, Bucharest, 2011, p. 164.

¹⁵² *Ibidem*, pp. 168-172. For a broader discussion on the advantages and disadvantages of converting the musical materials into digital format, see Nicolae Teodoreanu, “Fondul audio al Institutului de Etnografie și Folclor «Constantin Brăiloiu»”. Impactul noilor tehnologii”, in Laurent Aubert, *Memorie activă. Omagiu lui Constantin Brăiloiu*, op.cit., pp. 241-255.

¹⁵³ Pál Richter, “Colecția completă de cântece populare maghiare a lui Béla Bartók”, in Laurent Aubert, *Memorie activă. Omagiu lui Constantin Brăiloiu*, translation by Speranța Rădulescu, Ed. Martor, Bucharest, 2011, p. 234.

computers, which restore the work volume of 500 biblical scholars in less than a second. Modern corpora also have non-ecclesiastical origins, although in the 1950s, the Jesuit Father Roberto Busa started working on the electronic indexing of the words occurring in all the works of St. Thomas d'Aquino (*Index Thomisticus*), which he completed in the late '70s.¹⁵⁴

In their current version, corpora are the result of linguistic research and are meant to facilitate linguistic analyses. Although the term "corpus" has not always had the same connotation, nowadays it refers to an annotated collection of texts gathered in a database in electronic format.¹⁵⁵ The research conducted with the help of corpora can be divided into two main categories: corpus-based research (*corpus-based linguistics*) – which uses the corpus to validate, perfect, or, on the contrary, to invalidate an already-established theory or hypothesis in literature, and corpus-driven research (*corpus-driven linguistics*) – in which the corpus is regarded as having its own laws, which the researcher has to discover following the analysis of the corpus, to finally formulate the hypotheses and theories.¹⁵⁶ Progress in corpus-based linguistics was somewhat slow until the '80s and '90s, when the hardware and software revolution enabled the increase of word storage capacity and processing speed. The first corpora, created in the 1960s, defined the directions along which these collections had to be constructed and maintained. The Brown University Corpus (The Brown Corpus) created in that period, contained written texts already totalling one million words. In the course of a few decades, corpora amounted to billions of words, and today they are virtually unrestricted, if we consider the availability of on-line texts¹⁵⁷.

The things discussed so far allow us to better understand the characteristics of the corpus as an instrument of knowledge and its relationship with similar initiatives such as the archive, the encyclopaedia or the dictionary. A foremost characteristic of the corpus is the motivation that led to its construction: if the encyclopaedia and the dictionary are intended as explanatory tools and are structured accordingly (each term has a single occurrence in order to avoid redundancy, definitions or explanations are correlated among themselves to avoid contradictions, the order of presentation is not accidental but dictated by well-defined criteria), corpora do not have the strict an internal cohesion of the dictionary, nor the expository structure of the encyclopaedia, being rather an

¹⁵⁴ Michael McCarthy, Anne O'Keeffe, "What Are Corpora and How Have They Evolved?", in *The Routledge Handbook of Corpus Linguistics*, Routledge, 2010, pp. 3-13.

¹⁵⁵ Graeme Kennedy, *An Introduction to Corpus Linguistics*, Longman, London and New York, 1998, p. 3.

¹⁵⁶ Tony McEnery, Andrew Hardie, *Corpus Linguistics*, Cambridge University Press, 2012, pp. 5-6.

¹⁵⁷ Today the Internet is seen as a hypertext; a relevant work in this context is that of the team including Olga Pombo, António Guerreiro and António Franco Alexandre, *Enciclopédia e Hipertexto*, Lisbon, Duarte Reis Publishing House, 2006.

agglomeration of information that gains contour at the end of the scientific investigation process, unlike the dictionary (and even the archive), for which the relevance of the information contained therein lies precisely in the way in which they are structured by the author(s), from the beginning. While being at least as comprehensive as a (text or musical) archive, the main advantage of corpora is that of being able, at the end of a research process, to obtain information that can be entered into a dictionary (indeed, part of the current dictionaries have been compiled based on the research in corpus linguistics) or into an encyclopaedia (information related to various musical or linguistic dialects). Although a less effective tool for managing knowledge, the corpus is very effective in obtaining new information or in clarifying some already acquired information.

The corpus, just as the archive or encyclopaedia, is an extremely ambitious goal. Just as, ideally, history would be the depository of all human actions gathered along our existence as a species, the ideal corpus, no matter the field it intends to cover, would have to be an exhaustive quantitative representation of that field. However, as we have already seen in Eco, such Maximal Encyclopaedias are just intellectual fictions, impossible to achieve in practice. All a historian can do (just as a natural science researcher, whether a botanist, a zoologist, palaeontologist or geologist) is create a narrative based on the more or less data he has at his disposal.¹⁵⁸ For certain disciplines, i.e. those rooted in the discovery and analysis of the traces and testimonies left by various civilizations throughout time (be they archaeology, anthropology or ethnomusicology), Michel de Certeau's statement on history may be considered quite relevant: "By envisaging history as an operation, we may attempt, in a necessarily limited manner, to understand it as the relation between a place (a type of recruitment, a milieu, a profession), analytic procedures (a discipline) and the construction of a text (a literature)".¹⁵⁹ If in the case of an ethnomusicological corpus the first of these three stages is achieved along with the construction of the corpus, the analysis methods selected will be responsible for the constitution of the text, engendering that narrative that will result (perhaps even detach itself from the corpus) when the analysis has been completed.

2. Comparison

As a cognitive process, comparison belongs to the daily arsenal of human mental operations. Comparison is actually one of the most intuitive ways of acquiring knowledge, and is as simple as it is effective. It is central to any scientific

¹⁵⁸ A fundamental book for the problem of history as narrative is Hayden White's *Metahistory: the Historical Imagination in Nineteenth-Century Europe*, John Hopkins University Press, 1973.

¹⁵⁹ Michel de Certeau, *L'Écriture de l'histoire*, p. 64, apud. Paul Ricoeur, *Memoria, istoria, uitarea*, Editura Amarcord, Timișoara, 2001, p. 202.

endeavour, although there are few fields in which the foundations of its use are theorized and comparison is explicitly used as an investigative tool. Whether explicit or implicit, comparison is central to several humanistic sciences. Comparative linguistics, developed in Europe in modern times, has its roots in the work of the theologians and philologists of the first Christian centuries who worked on creating a best version of the Holy Bible, based on its Greek, Latin or Hebrew versions. In anthropology, the comparative approach underwent an important development in the course of the 19th and 20th centuries, through the work of researchers such as Edward B. Tylor, A. Radcliffe Brown or Claude Lévi-Strauss. But even outside the circle of humanistic sciences we come across fields such as comparative law or comparative anatomy.

Musicology makes no exception when it comes to the use of comparison in its specific investigations. Vasile Herman talks about a “revolution” in music composition and analysis due to the use of computer techniques or semiotics. Consequently, the development of a comparative musical analysis grounds its justification in the fact that it offers a broader perspective on the musical phenomenon than a traditional analysis. Its aim is to undertake a broad analysis of the style and means of expression used by composers in their musical works, by analysing the generative cells and motifs, the thematic profiles and the correlations that can be established between themes.¹⁶⁰ Another example of comparative analysis is the confrontation of the most used editions of J. S. Bach's *Sonatas and Partitas for Solo Violin* with the composer's manuscript. Here, the target points of the comparative research are the notation of note values, bow articulations and directions, the phrasing signs, fingering, ornaments, dynamics and agogics.¹⁶¹

Folklore is by definition a comparative discipline that seeks to analyse the data collected by researchers and thereby prove their relationship with, or differences from the already known materials. Thus, based on the comparative analysis of carols (Romanian or from other Eastern European countries), Petru Caraman identifies the characteristic types of this genre and states that the most important one for the Eastern European peoples is the Ukrainian-Bulgarian-Romanian type. At the same time, the folklorist seeks to determine the origin and direction of dissemination of the caroling custom in the geographical area in question.¹⁶²

¹⁶⁰ Vasile Herman, *Analiza muzicală comparată*, Ed. Media Musica, Cluj-Napoca, 2008, pp. 3-6.

¹⁶¹ Victoria Nicolae, *Contribuții la o cercetare comparativă a celor mai utilizate ediții ale Sonatelor și Partitelor pentru vioară solo de J. S. Bach*, Cluj-Napoca, 1989, p. 3.

¹⁶² Petru Caraman, *Colindatul la români, slavi și la alte popoare. Studiu de folclor comparat*, Ed. Minerva, Bucharest, 1983, p. 4.

Ethnomusicology is a discipline for which comparison, as stated by Constantin Brăiloiu, “became [in the 19th century] the supreme law and *raison d'être* of this newly-born discipline” and which was to retain this status at least until the Romanian ethnomusicologist wrote these lines.¹⁶³ In the early days of its institutional organization (the so-called Berlin School whose leading members were Curt Sachs, Eric von Hornbostel and Carl Stumpf), ethnomusicology was actually called comparative musicology, precisely in order to recognize the importance of this method within the discipline, but also its ultimate ambition of providing a comparative description of the musical cultures from all over the world. In a famous essay of 1885, Guido Adler was already mentioning a branch of systematic musicology called comparative musicology, which aimed at comparing the traditional songs of different peoples, countries and territories, grouping and ordering them according to their various characteristics.¹⁶⁴ For Adler, musicology as a field of investigation itself first appears when the musical sounds are rationally compared and analysed, based on their individual pitch.¹⁶⁵ The paradigm of natural sciences, extremely influential in the intellectual landscape of the 19th century, is strongly reflected in Guido Adler's thinking, where musicology – the science meant to discover the rules based on which art was formed and developed in different periods – had to operate in the same manner as the natural sciences, in order to achieve results of comparable accuracy. Thus, induction (the extraction of the commonalities and differences from several examples) and abstraction (the selection of certain concepts from a wide range of possibilities) are the foundations of musicological methodology.¹⁶⁶

In their definition of ethnomusicology, contemporary ethnomusicologists such as Bruno Nettl put the emphasis on comparison: ethnomusicology is the study of any music from a comparative perspective, in which each music is seen as part of a world of musics.¹⁶⁷ This definition is not very different from Adler's, except that in the latter's case, as Martin Clayton noted, comparison was reserved for the non-European musics, i.e. those that had too little in common with the high

¹⁶³ Constantin Brăiloiu, “Viața anterioară”, in Constantin Brăiloiu, *Opere*, vol. II, edition supervised by Emilia Comișel, Ed. Muzicală, Bucharest, 1969, p. 193.

¹⁶⁴ Erica Muggleston, “Guido Adler's “The Scope, Method and Aim of Musicology” (1885): An English Translation with an Historico-Analytical Commentary”, *Yearbook for Traditional Music*, vol. 13 (1981), p. 13.

¹⁶⁵ *Ibidem*, p. 5.

¹⁶⁶ *Ibidem*, p. 16.

¹⁶⁷ Bruno Nettl, *The Study of Ethnomusicology. Thirty-One Issues and Concepts*, University of Illinois Press, 2005, p. 60.

art of the civilized West.¹⁶⁸ Of course, between the two authors there is a chronological difference of more than half a century, during which, under the influence of cultural anthropology and post-colonial studies, traditional music ceased to be considered inferior to Western art music, and ethnomusicology came to be regarded as the study of music as a part of culture (Alan P. Merriam). Nettl notes that if, in the beginning, ethnomusicology thrived on comparison, over time (and particularly after the Second World War), it became increasingly obsolete, being suspected of providing improper interpretations of the musical cultures, based on similarities and differences.¹⁶⁹ The deficiencies that marked the beginnings of this discipline were pointed out and highlighted by Constantin Brăiloiu, who frequently criticized the monogenesis theory upheld by some comparatists who claimed that cultural assets (musical ones included) originated in one single focal point, from which they gradually expanded throughout the world, but which have evolved to perfection only in the European civilization. Hence, the rest of the civilizations were considered to be situated on different stages of development (the Iron Age, the Bronze Age, the Middle Ages), and their music, stuck somewhere on the way that should inevitably lead to the high art of Europe.¹⁷⁰

This Euro-centric perspective prevailed as long as the colonial empires of the West survived, a time during which the theory and practice of ethnomusicology used to serve, whether implicitly or explicitly, as supporters of the expansionist policies of these empires. The suspicion towards the comparative method in ethnomusicology was also fostered by the fact that those who ventured to make generalizations based on this method were relying – between the end of the nineteenth century and early twentieth century – on a limited number of musical examples to draw their conclusions from. Bartók himself noticed this lack of sufficient collections of traditional music, saying that in order to make comparisons, 50 or 100 copies are not enough, and that credibility can only be achieved from a few thousand upwards.¹⁷¹ Moreover, it sometimes happened in the analytical process that only those musical examples were selected for comparison that were deemed most relevant for the thesis in question.¹⁷² After

¹⁶⁸ Martin Clayton, “Comparing Music, Comparing Musicology”, in Clayton, Martin, Herbert Trevor, Richard Middleton (eds.), *The Cultural Study of Music: A Critical Introduction*, New York: Routledge, 2003, p. 58.

¹⁶⁹ Bruno Nettl, *op. cit.*, p. 61.

¹⁷⁰ Constantin Brăiloiu, “Etnomuzicologie II. Studiu intern”, in *op. cit.*, p. 175.

¹⁷¹ Béla Bartók, “Comparative Music Folklore” (1912), in Béla Bartók, *Essays*, selected and edited by Benjamin Suchoff, Faber & Faber, London, 1976, p. 155.

¹⁷² Patrick E. Savage and Steven Brown, “Toward a New Comparative Musicology”, *Analytical Approaches to World Music*, 2.2 (2013), p. 158.

1950, as a reaction to this lack of sufficient musical materials, ethnomusicologists ended up dedicating themselves to the study of a single culture, a comprehensive study that would sometimes take a lifetime, a type of research which, while admitting the existence of similarities between certain musical elements from different cultures, concluded that, after all, every culture has such a distinct music that any attempt of comparison would be faced with methodological and conceptual difficulties.¹⁷³ An alternative to this super-specialization, which preserves the advantages of comparison, is provided by Constantin Brăiloiu, who, after founding a music archive in Geneva containing numerous musical examples from all the continents, manages, based on the study of these materials, to dive deep into the structure of traditional music and identify some of the rhythmic or melodic regularities shared by repertoires from distant geographical areas. It was only by consulting such an archive that the researcher could acquire the necessary knowledge to rise above the level at which the observable contrasts within the same culture could only confuse and put at risk the formulation of any theory or hypothesis, offering instead the possibility of drawing conclusions that would take into account musical manifestations in regions such as Africa, Asia or Oceania.¹⁷⁴

Bruno Nettl points out that ethnomusicologists have often relied on comparison, but have never managed to agree on a uniform method of comparison, as have, for example, linguists or anthropologists. This was despite the fact that eminent scholars have explicitly stated the connections of this method with similar practices in anatomy (Hornbostel) or linguistics (Bartók). From Hornbostel, whose studies, without making explicit reference to comparison, used a single analytical model in studying the music of different cultures, to Alan Lomax and his classification of cultures based on their specific vocal productions, there have been several models proposed for the comparison of the musical styles, repertoires or individual works, each with varying degrees of success and recognition among specialists.¹⁷⁵

Another criticism to comparison, mentioned by the same author, is brought forward by ethnomusicologists originating from outside the European (or at least Western European) space. Some of them claim that one cannot know a culture unless they belong to that culture. In this case, each scholar has the unique possibility (and entitlement) to study and know the musical realities specific to the culture they belong to, in which case the comparison not only loses its legitimacy, but becomes downright impossible to achieve.¹⁷⁶ Such criticisms have also been

¹⁷³ Bruno Nettl, *op. cit.*, p. 63.

¹⁷⁴ Constantin Brăiloiu, "Viața anterioară", in *op. cit.*, pp. 217-218.

¹⁷⁵ Bruno Nettl, *op. cit.*, p. 66, 71.

¹⁷⁶ *Ibidem.*, p. 67.

formulated in Romanian ethnomusicology during the inter war period, in a political climate marked by nationalist overtones (criticisms to which Bartók himself was also subjected). If during the inter war period nationalism was responsible for such positions, in the postwar decades the idea of the *insider* being the only one able to understand his own culture was favoured by the rise of cultural anthropology and its methods of operation, which were taken over by ethnomusicologists as well. In this new paradigm, music reflects the culture it belongs to, while ethnomusicology is a method of study that can be applied to all the musical systems on earth.¹⁷⁷ A certain amount of caution is nevertheless required when comparing two or more different musical cultures, because, as Nettl also emphasizes, starting from the presumption of their scientific neutrality, specialists have often been inclined to highlight homogeneity to the detriment of diversity. Such conclusions have been drawn mostly based on the similarities between cultures, musical genres or melodies, given that the discovery of such similarities can impress the comparative researcher and demonstrate their ideas more easily.¹⁷⁸

Although in the second half of the twentieth century comparison fell into a cone of shadow, it is still present in ethnomusicological analyses, even if only in the subtext. In recent times, the advantages of the comparative approach have been brought back into discussion, as a result of the advantages offered by the considerably larger musical collections than at the beginning of the last century, and of the automated computing technologies. Such an initiative, proposing the re-establishment of comparative musicology, outlines five directions in which such research might be developed: 1. classification; 2. the cultural evolution of music (the processes of transmission, variation and selection of the musical materials); 3. music and human history (music as a human artifact and historical document); 4. musical universals (cultural or biological) and 5. the biological evolution of music (the origins of music and its adaptive functions).¹⁷⁹ These authors propose creating, based on the vastest material available, a variety of musical samples characteristic of the cultures to be compared (with the mention that in the previous studies the most flexible such samples consisted of 30 items). These samples can then be compared, either manually or automatically, as is frequently exemplified in the literature on the subject.

¹⁷⁷ Alan P. Merriam, "Ethnomusicology. Discussion and Definition of the Field", *Ethnomusicology*, Vol. 4, No. 3, 1960, pp. 110-111.

¹⁷⁸ Bruno Nettl, *op. cit.*, pp. 68-69.

¹⁷⁹ Patrick E. Savage and Steven Brown, "Toward a New Comparative Musicology", *Analytical Approaches to World Music*, 2.2, 2013, p. 150.

Another argument in favour of comparative musicology comes from Nicholas Cook, who notes that the transformation of “comparative musicology” into “ethnomusicology”, i.e. the demotion of comparison from the preoccupations of the researchers in the field, brought to the forefront the specialist dedicated to the knowledge of a single culture. But what Cook notices with great accuracy is that this shift of paradigm from extensive to intensive coincided with the emergence of a new form of musicological analysis – the automatic one, in which the computer could much more easily achieve the objectives set by the early 20th century comparatists. Thus, the possibility of comparing large amounts of data occurred right at the moment when this idea had already become obsolete. This could only result in the marginalization of the computational methods within this discipline.¹⁸⁰ For Cook, computational analysis enables an objective representation of music, where comparison, performed quickly and accurately, can lead to the identification of important characteristics of the material under study. In order to substantiate his position, Cook describes a series of such experiments performed with the help of a software for music research called *The Humdrum Toolkit*, developed by David Huron of Ohio State University and whose results were immediately evident.

2.1. Comparison in Romanian ethnomusicology

In Romanian ethnomusicology, there are no theoretical studies on comparison, its methods or its common ground. There are nevertheless numerous studies that make explicit or implicit use of comparison as an inherent practice in ethnomusicological analysis. Below we will summarize three of such studies.

Upon studying segmentation with the specific symmetry of 1 + 2 + 1 of the four-line stanzas, Ileana Szenik notes that the constituent elements in one of the melodic groups of Romanian new style bear a striking resemblance to those in the Western and Hungarian songs in which Z. Kodály had sought the origins of the Hungarian new style.¹⁸¹ These songs, which made their way into the Hungarian folklore via the religious and/or secular repertoire of Western European or Northern Slavic origin, are characterized by four-line melodies of the architectonic structure AA⁵BA. In the Romanian folklore, this pattern spread through the proliferation of a heterogeneous repertoire of local semi-art songs.¹⁸² In certain variants, the content of the Romanian verses and the metric structure confirm this

¹⁸⁰ Nicholas Cook, “Computational and Comparative Musicology”, in Clarke, Eric and Nicholas Cook (eds.), *Empirical Musicology*, Oxford University Press, 2004, p. 103.

¹⁸¹ Ileana Szenik, “Folclorizarea variantelor românești ale unui model melodic occidental”, in Ileana Szenik, *Studii de etnomuzicologie*, vol. III, Editura Media Musica, Cluj-Napoca, 2008, p. 30.

¹⁸² *Ibidem*, pp. 32-33.

Nettl, of identifying the common features and the conclusions based thereon). In contrast to the previous case, the author embraces the comparative perspective, stating that “comparative folklore is one of the most effective means to gain knowledge about a human group, its history and its relationship with other peoples.”¹⁸³ Here, the dichotomy between similarities and differences is approached by establishing a balance between the terms, in which the similarities reflect, according to the author, the continuity of a common Indo-European genetic pool of material and spiritual resources, while the differences indicate the specific nature of each people manifested in the treatment, combination, alternation and variation of the common means of expression; at the same time, the differences arise from their specific living conditions, psychological traits, language spoken and aesthetic conception.

The comparison starts with a review of the genres, where Emilia Comișel notes the existence – in France, Italy, Spain, Greece and Romania – of the lullaby songs, of the repertoire for weddings and funerals, or of the specific repertoire for the winter holidays, all of which share common poetic and musical characteristics. Parallels can be noticed not only at the level of the literary content or function, but also at structural level. Thus, the lullaby song of these peoples (except for Greece) has the same strophic melody, with little development and the same syllabic melody in which the specific refrain becomes a typical generative element. Regarding the epic song, in addition to certain already well-known, common literary subjects, the Romanian folklore and that of the area here in question have in common the “epic recitative”, i.e. the musical style characteristic of the “classic” epic style. In turn, the song proper shares certain common features throughout all the cultures studied: the free association between text and melody; the fixed, closed architectonic structure, frequently enhanced with one or more refrains; a varied sound material, from hexachord systems to medieval modes and modern modes, diatonic or with chromatic elements (with augmented second); the prevalence of the major-minor parallelism or special modal structures; varied rhythmic structures in *parlando rubato*, *giusto syllabic*, *aksak* or divisionary system. Common features are also found in the vocal genre called *hore lungă* or long song.¹⁸⁴

Emilia Comișel continues with a more detailed analysis of certain discursive elements such as the melody, the sound material or the architectonic structure. With regard to melody, the author notes that the vocal melody is generally based on a 6- or 8-syllable metrical pattern, in binary form (to which more extended patterns are also added), melodies can be syllabic, melismatic or

¹⁸³ Emilia Comișel, “Elemente comune în muzica folclorică a popoarelor balcano-danubiene și mediteraneene”, in *Studii de muzicologie*, vol. XVIII, Editura Muzicală, Bucharest, 1984, p. 250.

¹⁸⁴ *Ibidem*, pp. 256-260.

mixed, and the descending melodic line is prevalent in the last line. The sound material comes in several degrees of complexity: from pre- and pentatonic systems, to medieval modes and hexa- or heptatonic modes. The architectonic structure is based on common principles of construction of the melodic stanza or of the period in instrumental music, the most widespread ones being the repetition, whether varied or not, of the melodic motifs and their grouping into fixed (strophic) or free forms. The differences arise in relation to the grouping of the verses, in that Romanian songs have no poetic stanzas, unlike certain genres of Italian or Greek songs. On the other hand, if the Romanian and Greek old-style repertoire is based on isometric lines, in other areas, verses are less symmetrical in terms of melodic lines.¹⁸⁵

The author concludes that this type of comparative study has brought to light some of the common elements and characteristics of the folklore of the European Mediterranean peoples, which come to confirm, on the one hand, the persistence of an ancient pool of common culture, and on the other, the existence of some cultural interferences that have facilitated the borrowing of certain elements or of whole works representing a later stage in the individual evolution of the traditional cultures analysed.¹⁸⁶ The comparison undertaken by the author is based on a relatively small number of examples, given that at the time when this study was written, manual comparisons could only operate with limited amounts of samples. The problem raised here refers to the criteria of construction of these samples, and while there is no doubt that Emilia Comișel was a specialist able to gather a limited albeit representative amount for the Romanian folklore, things get more complicated when it comes to the folklore of other peoples/nations, where establishing a representative sample might prove to be a difficult and risky task for the expert in a single musical idiom. But assuming that we choose to work with samples that have already been created by foreign specialists, a comparative approach like the one proposed here, one of international (South-East European) scale, runs the risk to remain inconclusive due to lack of a sufficient number of materials for comparison. In fact, many of the conclusions reached in Emilia Comișel's study could easily be extended to other geographical areas as well, whether or not related to the Mediterranean basin or whether or not of Indo-European provenance (which, by the way, goes so far back in time that, aside from generalities, is most unlikely to reveal any concrete data related to itself). This is especially as from the studies conducted by Constantin Brăiloiu during his later years, we already know that certain rhythmic patterns (*giusto* syllabic, *aksak* or the children's rhythm), performing practices (melismatic singing in *hore lungă* style) or

¹⁸⁵ *Ibidem*, pp. 263-275.

¹⁸⁶ *Ibidem*, pp. 279-280.

intonational structures (pentatony) are present all around the world and could be considered as universal constants (which were also mentioned by Emilia Comișel in her study). Thus, for a study like the one described above to have a higher degree of relevance and establish profound connections or dissociations, a greater amount of information is required, along with greater calculation capacity than the human intellect can provide.

The last study of Romanian ethnomusicology presented in this study and relying on the comparative method belongs to Ilarion Cocișiu and is entitled *Despre răspândirea geografică a unui cântec de stea* [On the Geographical Spread of a Christmas Carol]¹⁸⁷. In his study, Cocișiu employs the method of the synoptic transcription of variants, which had already been used by Brăiloiu in his studies on the lament from Drăguș and from the Oaș region (1932 and 1937), as the author mentions at the beginning of his article. This type of synoptic transcription emphasizes precisely the differences that occur between several variants, thereby facilitating the comparative analysis. The first problem indicated by the author in the context of such an approach is the choice of the melody-type against which the variants are placed. Once this mission is accomplished, the variants are presented in the order in which the variations become more and more numerous and increasingly distanced from the chosen type. In the course of this gradual process of distanciation, the accumulation of differences will result in the creation of a new melodic type that can be studied separately. For the purpose of his study, Ilarion Cocișiu chooses, as main type, one of the variants found in Sabin Drăgoi's¹⁸⁸ collection of *303 colinde cu text și melodie* [303 Carols with Text and Melody]:

Example 2: the main type established by Ilarion Cocișiu in the comparative study on Christmas carols

The image displays two staves of musical notation in a single system. The first staff begins with a treble clef and a common time signature. The melody consists of quarter and eighth notes. Below the staff, the lyrics are written in Romanian: "Lă - u - dați pe Dum - ne - zeu, Ma - re - le ar - hi - e - reu,". The second staff continues the melody, also in treble clef and common time. Its lyrics are: "Că s-a nă - s - cut azi Hris - tos, În - tra lui A - dam fo - los." The notation includes various note values and rests, with some notes beamed together.

This song is particularly popular in Southern Transylvania, including the (inter war) counties of Brașov, Făgăraș, Sibiu, Târnava-Mare, Alba and part of Turda, Târnava-Mică and Hunedoara. To make sure that his analysis is soundly anchored in the musical reality of the area under study, the author undertakes field

¹⁸⁷ Published in the journal *Sociologie românească*, No. 10-12, 3rd year, October -December 1938 and in: in Ilarion Cocișiu, *Contribuții la etnomuzicologia românească din prima jumătate a secolului XX*, Editura Charmides, Bistrița, 2014.

¹⁸⁸ Ilarion Cocișiu, "Despre răspândirea geografică a unui cântec de stea", op. cit., p. 41.

research in the region's villages to collect variants and to see the extent to which this song is still alive in the winter ceremonial practices. Thus, he manages to confirm the existence of four main melodic types of this song, and to indicate, based on the field research, the dominant melodic type for each village. It is also based on the frequency of occurrence of this song that he concludes that, given its wide circulation in the Făgăraș and Târnava Mare counties, these areas are, probably, the very places of origin of the song.¹⁸⁹

After these general considerations, Ilarion Cocișiu moves on to a presentation of this primary melodic type with all its variants, measure by measure, to then describe only the main melody of the other three melodic types, without taking their variants into account. Finally, based on the comparative analysis of all the variants of the four main melodic types, a few general conclusions are drawn: the prevailing mode is the modern major mode, with a range of a seventh, but with many variants in which the range is limited to a fifth; cadences fall on the degrees 1, 3, 3, 1 in the first three types, and on the degrees 5, 3, 3/1, 1 in the fourth type; the melody has a descending line, moving by steps and thirds, and occasionally by fourths and fifths; the metronomic tempo ranges from eighth note equals 116 to eighth note equals 208; ornament notes are few and occur in the variants collected from the region of the Apuseni Mountains.

The analysis conducted by Ilarion Cocișiu, though not explicitly stated as such, is comparative, and proved the effectiveness of the synoptic transcription method. This type of analysis offers researchers the opportunity to probe into the smallest details of the sound structure of the material studied, but here, again, the quantitative limit should be considered, in that if the number of examples is too large, the accuracy of the analysis decreases proportionally. In the case at hand, we are dealing with a total of 71 musical examples, all coming from a compact geographical area, which entitles the author to draw certain conclusions about the geographical distribution of the song and its forms of manifestation.

2.2. Comparison in contemporary ethnomusicological research

With the advent of the large-scale musical corpora, the automated comparison of songs has become a necessity. If the manual comparison of a song's variants or even of the musical folk collections among themselves is a task that can be carried through by a researcher with no help other than his knowledge and skills, in order to be able to compare different sections of a corpus, or even two or more corpora among themselves, the automation of the process becomes inevitable for the success of the action. The identification of the variants of a song and their

¹⁸⁹ *Ibidem*, p. 42.

grouping into the same “family of melodies” can be achieved by comparing the melodic contours of the melodies. Zoltán Juhász and János Sipos¹⁹⁰ extracted the melodic contour of approximately 25,000 melodies belonging to 16 corpora from Eurasian countries. The melodic contours resulting from each corpus were introduced in a self organising map¹⁹¹. This resulted in 16 self organising maps representing, based on differences and similarities, the melodic contours of the melodies in each corpus. By overlapping these maps, a super-map was obtained highlighting the similarities and the differences between the melodic contours resulting from the 16 collections.

Daniel Shanahan and David Huron¹⁹² tested, based on two traditional music corpora, i.e. German and Chinese, the hypothesis expressed in linguistic research according to which the pitch of the voice declines towards the end of the phrase. The hypothesis formulated by the two researchers claimed that the tendency for pitch variability to decline over the course of an utterance was also observed in melodic phrases. Once the hypothesis was tested on the two corpora, it was found that only the corpus containing traditional German songs is consistent with this prediction, while the one incorporating Chinese songs has a diametrically opposed evolution. The authors therefore conclude that the linguistic hypothesis has no general validity in music, where the cultural contexts can vary widely.

Outstanding results can be obtained if one also takes into account the geographical location of the samples of the corpus. Recent studies of corpus linguistics demonstrate the connection between the geographical provenance of the materials of the corpus and their semantic characteristics¹⁹³. Such applications also exist in music, and David Huron and B. Aarden¹⁹⁴ managed to establish direct links, based on several musical corpora, between the geographical coordinates and their corresponding musical folklore.

¹⁹⁰ In “A Comparative Analysis of Eurasian Folksong Corpora, Using Self Organising Maps”, *Journal of Interdisciplinary Music Studies*, 2010, vol. 4, No. 1, pp. 1-16

¹⁹¹ The self organising maps, the equivalent of the artificial neural networks, simulate the self organising process of the central nervous system, based on a numerical algorithm. Represented by a two-dimensional plane, these maps are able to organize the objects/vectors received as input based on their degree of similarity. Thus, vectors with similar values will be placed in adjacent areas on the map, while vectors with different values will be placed in distant areas of the map.

¹⁹² In “Interval Size and Phrase Position: A Comparison between German and Chinese Folksongs”, *Empirical Musicology Review*, Vol. 6, No. 4, 2011.

¹⁹³ In Max Louwerse, Rolf Zwaan, “Language Encodes Geographical Information” *Cognitive Science*, 33, 2009, 51-73.

¹⁹⁴ In “Mapping European Folksong: Geographical Localization of Musical Features”, *Computing in Musicology*, 12, 169-183, 2001.

Regarding the possibility of making comparisons within the same corpus, Petri Toiviainen and Tuomas Eerola¹⁹⁵ extracted, from the melodies of the corpus Essen Folksong Database, information on the succession of notes, intervals used and corresponding durations. All these parameters were represented by a vector that was projected on a self organising map, where they were grouped according to the similarities between them. This yielded a general overview of the successions of notes and durations that are most commonly used in the corpus.

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¹⁹⁵ In "A Method for Comparative Analysis for Folk Music Based on Musical Feature Extraction and Neural Networks", *VII International Symposium on Systematic and Comparative Musicology*, Jyväskylä, Finland 2001.

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