WHAT TO DO WITH A DIGITIZED COLLECTION OF WESTERN FOLK SONG MELODIES?

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1. INTRODUCTION

This contribution aims to suggest some items for the research agenda of Computational Folk Song Research, based on a selective historic overview of the research tradition of Western Folk Song Research and on the current methods and foci of Computational Musicology and Music Information Retrieval. We specifically focus on folk songs from Western Europe, such as the Dutch or German. For example, the *Meertens Tune Collections*, consisting of thousands of digitized recordings, symbolic representations and metadata of folk songs from Dutch oral tradition, [1] or the *EsAC Folksong Databases*, which currently includes over 20,000 digitized song melodies from various countries in Europe and beyond (Schaffrath, 1995).

2. ELEMENTS OF THE HISTORY OF FOLK SONG RESEARCH

During the major part of the 20th century an enormous amount of work has been carried out on structural research on folk song melodies. As a starting point we take the contest that was organized by Dutch musicologist Daniel F. Scheurleer (1900) for the best way to provide a lexical ordering for a collection of folk song melodies. The solution of one of the contestants, Ilmari Krohn (1903), has had a profound influence on many approaches to the same question during the 20th century. Krohn proposed a classification system in which the number of phrases and the sequence of cadence tones determine the ordering of the melodies. Bártok devised a classification system for Hungarian folk melodies taking Krohn's system as starting point (Bártok, 1981, p. 6). The parallel work of Zoltán Kodály and what followed in Hungarian folk song research is summarized by László Dobszay (1988).

In American folk song research, Bayard's (1950) definition of tune family and Bronson's (1950) analysis of stable melodic elements reflect similar interests in ordering and classifying folk melodies within a broader interest in the study of variants. In the course of the century, a plethora of classification systems came into existence, none of which provides a general solution to the explicit or implicit aims of facilitating retrieval of melodies, and demonstrating the relations between melodies.

A remarkable research project that still captures the

imagination of many minds is the Cantometrics project, led by Alan Lomax Lomax (1968). One of the objectives of this ambitious empirical project was to devise a descriptive system that is applicable to all of the world's folk song styles in order to to connect styles of folk song performance with other aspects of culture. Several thousands of songs were analyzed using 37 performance features. One of the results was a 'world song style map'.

All of these studies show an interest in the melodic material as object of research. However, the focus of researchers has shifted away from this topic towards other directions, as has been noted by Bruno Nettl (2005, p. 130) at the end of his overview of the history of research on melodic identity and oral transmission of melodies. The last decades of the 20th century show a decrease of interest in folk song melodies as such. There are several more or less interconnected causes for this. An important factor is the fading away of such underlying ideological motivations as were initially advocated by Johann Gottfried Herder (1744–1803) in the second half of the eighteenth century (Schepping, 1994). According to Herder, who introduced the term *folk song* ("Volkslied"), 'authentic' folk songs show the *soul* ("Geist") of the people. Therefore, collecting and studying folk songs was a meaningful endeavor from the perspective of people's identity, which also got connected with national identity ("one country, one language, one people"), and with history: through studying authentic folk songs, investigators hoped to find traces of ancient, pre-Christian culture that was supposed to still live on in rural areas, far away from emerging urban cultures. In the course of the 20th century, this paradigm was abandoned by ethnologists (Bendix, 1997).

Another cause is the parallel shift in other areas of Musicology away from 'positivistic' research on scores and recordings towards more anthropological and social approaches, which is indicated as 'New Musicology' (Kerman, 1980).

Currently, new approaches in Digital and Computational Humanities are quickly gaining ground. For music, the Music Information Retrieval (MIR) community is one of the most important catalysts for computational research on music. Given the nature of this kind of research, a focus on the musical 'material' rather than its cultural context or social function is inherent to the type of studies in this field. This stimulates a renewed interest in the contents of many of the ethnomusicological archives that were established

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[1] The public release of this data set is in preparation for 2014.

during the 20th century, including those with Western folk song melodies. However, the underlying motivation is of a kind that is very different from the 20th-century folk song researchers. An illustration of this is the way in which the EsAC collection is used in MIR research. Virtually all papers in the proceedings of the yearly conference on Music Information Retrieval (ISMIR), in which this set of melodies are used, do not show an interest in folk music as such. Instead, the melodies are taken as just a collection of labeled musical data to test segmentation algorithms, melodic similarity measures, pattern discovery algorithms, and the like. The meta-data that comes with the collections (e.g., region of origin, tune family membership, segment boundaries), are used as ground-truth data for corresponding MIR tasks.

The 'mis-match' between the nature of the EsAC-collection and the purposes for which it is employed raises the question whether there are research questions that could be addressed properly using such a collection, taking a computational approach. More precisely: given the rich history of classification systems, given the state-of-the-art in Music Information Retrieval, given the shifting ideological backgrounds and aims, what are sensible steps to take in computational research on folk song collections?

It seems that Scheurleer's question of classification has lost its relevance because of the many possible ways in which a collection of digitized music can be queried in a modern music information retrieval system. The Herderian aim of revealing a nation's identity by studying its folk songs, is obviously left behind as well. Since it is hard to regard folk songs such as the Dutch or German as a continuously developing tradition — as opposed to vibrant oral traditions such as found in Africa or the Near-East — there is also no strong motivation from the perspective of understanding current musical culture.

3. WHAT TO DO WITH A COLLECTION OF DIGITIZED WESTERN FOLK SONGS?

We present various ways in which a digitized collection of folk songs can be used as research data.

An important property of folk melodies from Western oral tradition is the fact that such melodies were sung by ordinary people with little or no formal musical training. Therefore, these collections offer a rich source of material to study human musicality, including memory for melody, strategies of lyrics-placement, properties of singing, common errors, etc. These are all research interests that are relevant in the field of music cognition. An example of this can be found in the work of David Temperley (2008), who extensively used the EsAC collection to support his theory of melodic perception. Another example is the study by Von Hippel and Huron (2000), who used a corpus of folk song melodies to show that the gap-fill rule, which states that a melodic leap should be continued stepwise in the opposite direction, can be fully explained by the statistical phenomenon of regression to the mean. Yet another example is a forthcoming study from our research group that shows that memory for absolute pitch plays a

role in oral transmission by comparing the pitch-contents of recorded variants of a tune family.

Since Narmour (1990) presents his implication-realization theory of melodic structure to be independent of specific style, a collection of folk melodies can be used as empirical data to challenge this theory. Indeed, Schellenberg (1996) employed British folk songs to assess and refine various aspects of Narmour's theory.

Another, though related, set of research questions comes from Folk Song Research itself: investigating oral variation. A collection of recordings such as the Dutch collection *Onder de groene linde* (Grijp, 2008) contains a number of variants of a tune, which allows for investigating stability in oral transmission, which, in turn, sheds light on aspects of human cognition of music. Nettl (2005, 295ff) discusses the constituting musical elements of oral traditions. He proposes that the study of an oral tradition should be directed at the basic 'unit of transmission'. Bohlman (1988) lists some common units of transmission from an analytical perspective. He observes that the whole piece can function as the smallest unit of transmission, but smaller melodic elements such as formulae, conventions, motifs and phrases can also be found as the units of transmission. The study of units of transmission could be addressed with pattern discovery algorithms. The understanding of what units of transmission are can be improved by studying and interpreting the discovered patterns and adapting the discovery algorithm according to sensible hypotheses. Such an approach of confronting algorithmic output with musical and cognitive theories or hypotheses could contribute to the understanding of human musicality. In our own work, we set out to test several hypotheses about stability in oral transmission that relate to harmonic, rhythmic, and melodic aspects.

An emerging field of research has recently been established by increased interest in digitization, curation and unlocking of cultural heritage. One example is the Europeana.eu portal,[2] which aims to unlock Europe's cultural heritage, including folk song audio collections. To unlock and search digitized artifacts, adequate models and tools are needed.

Finally, as has been done in Music Information Retrieval, a collection of monophonic melodies can be used as ground-truth for testing various kinds of MIR-tasks as mentioned in the previous section. We would advocate, though, to interpret algorithmic results on these data sets from a musical or cognitive point of view as much as possible (Van Kranenburg, 2013). This implies putting the 'ground-truth' into question as well, rather than taking it for granted, which goes beyond merely assessing classification accuracy, and which will lead to an increase of knowledge of music.

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[2] http://www.europeana.eu, accessed 18 May 2014.

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