Sounds produced by animals provide valuable information in terms of their biology, ecology or evolution, and also play a crucial role in wildlife conservation. Despite a great interest and numerous research studies there are still several fields of animal acoustic communication that remain understudied. One of them regards the function of signal amplitude which is an inherent feature of every sound, and determines its loudness. To date, most of research studies focused on the function, context and acoustic structure of high-amplitude sounds produced by animals, which propagate over long distances and serve different functions like mate attraction, signalling territory occupancy or managing social interactions. The amplitude of a signal is an variable characteristic and many species were observed to communicate with the distinctive low-amplitude sounds, also known as soft or quiet signals. The difference between low- and high-amplitude signals is often observed not only in the amplitude level, but also in the signal structure itself. This suggests that low-amplitude signals may belong to a unique signal class and serve distinct functions when compared to their high-amplitude counterparts. In research reported to date, low-amplitude signals have been reported in insects, fish, amphibians, birds and mammals, and are produced in a variety of social contexts that are directly related to fitness, such as courtship behaviour, aggressive interactions, or alarm signalling. However, it is unclear why selection promoted the evolution of low-amplitude signals in so many distinct social contexts and why animals choose to communicate in this peculiar way. The phenomenon of low-amplitude signalling is still poorly understood, and learning more about the low-amplitude signalling may bring new insights to various aspects of acoustic communication such as signal development, its transmission and perception, or honesty and reliability.

Low-amplitude signals are frequently used during agonistic interactions, for example between rival males. In birds, low-amplitude versions of their songs have been defined as soft songs. Soft songs are usually produced by territorial males when the rival is within close range, which indicates that they may serve as a display of the males' intentions or fighting abilities. However, this information is contained in a normal, high-amplitude territorial song. So why would territorial males use different types of signalling to get the same message across? Soft songs used in aggressive interactions were found to vary in acoustic structure from normal high-amplitude songs. This suggests that soft songs may convey different information and possess different functions than a high-amplitude song. The reliability of soft songs as a signal used in an aggressive context is also a topic of debate, since they require relatively little metabolic energy and low-quality males may fake or exaggerate them. Finally, contrary to soft songs, high-amplitude signals can be heard over longer distances and the information they carry may reach numerous receivers. So why do territorial males use soft songs, which seem to be a less effective form of communication?

The aim of the proposed project is to define, whether low-amplitude signals function as aggressive signals in the tested species, or are they only produced in an aggressive context but have a different meaning. A series of playback experiments simulating territorial aggression have been planned to check whether soft songs fulfil all criteria defining signals as aggressive. On the other hand, by investigating the *response evoking hypothesis* we may gain evidence that soft songs are produced in an aggressive context but are not an aggressive signal. This recently proposed hypothesis has never been directly tested before. It argues that soft songs serve as a tactical move to evoke a response from an recent intruder in order to reveal his intentions, locate him or ascertain that he is still present. Simultaneously, the proposed project will examine the acoustic structure of soft songs and verify whether and to what extent is low-amplitude signalling widespread in birds during agonistic interactions. Experiments will be conducted on several songbird species breeding in acoustically different habitats. Habitat-dependent selection is considered to be an important driver shaping the evolution of birdsongs, and I expect to observe differences in the utilization of low-amplitude signalling between species inhabiting acoustically different habitats like forests or meadows. The novelty of this project concerns planned amplitude measurements and playback experiments which will allow to associate birds' visual and vocal behaviour with the amplitude of acoustic signal they produce.

The proposed project will explain the function and reliability of soft songs used during agonistic interactions, show how selection shaped them in acoustically different environments and describe their acoustic structure. Answers gained within this study will lead to a better understanding of vocal signalling in birds, shed light on mechanisms ensuring signal reliability and the evolution of distinctive low-amplitude signalling observed in many taxa and in different ecosystems.