1. Research project objective:

In today's multilingual and emotionally-charged social reality it is particularly important to understand *how emotions and language interact*. After all, we use language both to exchange information and to express our feelings and attitudes. Recent research demonstrates that the brain detects emotional content in words already within 0.1 second. This testifies to a robust impact of emotion on language comprehension. <u>Yet, this may not necessarily be the case when we perceive or express emotions in our second language</u>. Indeed, there is cumulated evidence showing that bilinguals may be *insensitive* to negative emotions when operating in their second language. The available evidence, however, is limited to how people *comprehend* emotional content in the languages they know. <u>Little do we know about the *neurophysiology of emotional speech production*,</u> whose understanding seems critical to advance the knowledge about how emotions impact communication in social, clinical, political, and multicultural contexts.

2. Research goal:

In this project, we aim to broaden the scientific knowledge about 1) the role of emotion in speech production, 2) the underlying brain mechanisms involved in emotional word and sentence production, and 3) the modulation of these processes by the first and second language. To achieve this, we investigate the *physiology* and *brain dynamics* of emotional speech *production* in the first and second language of Polish (L1) – English (L2) bilinguals. We also analyze how bilinguals physiologically *prepare* for producing emotional speech (so-called *affective anticipation*), and how it may be modulated by the emotional and linguistic context. In two studies consisting of four experiments we will combine skin conductance (SC) and electroencephalography (EEG) to record participants' production of negative and neutral words (Study 1: Experiment 1A, 1B) and sentences (Study 2: Experiment 2A, 2B). We will manipulate an anticipation cue type (Experiment 1A, 2A: neutral cue; Experiment 1B, 2B: emotional cue) to examine their impact on subsequent single word (Study 1) and sentence (Study 2) production.

3. Methodology employed in the research project:

Skin conductance is a non-invasive measure that reflects electrodermal responses to emotionally salient stimuli. This method is based on the assumption that increased sweating results in an increased skin conductance level. EEG provides a direct measurement of neural activity with millisecond precision. This gives an optimal insight into how the brain activity is affected by emotional stimuli in real time. Thanks to the coordinated use of SC and EEG, we will obtain valuable insights into the neurophysiology of the intersection of emotion and speech in bilinguals.

4. Expected results and significance of the project:

Our project will make innovative, <u>groundbreaking advances in the science of emotion and language</u> by using multiple techniques to derive metrics measuring emotional speech production and anticipation in the first and second language. In view of the fact that nowadays people more and more often communicate in their nonnative language, our findings will help to understand how emotions, especially the negative ones, shape language production, and how they frame communication in consequence. It will <u>advance current knowledge about the physiology and brain dynamics of emotional speech production</u>, providing answers and raising timely questions in the field of affective neurolinguistics. The methodology that we will employ will <u>extend the current understanding of emotional speech production in normal and clinical contexts</u> (e.g., depression, autism spectrum disorder, aphasia, neurodegenerative disorders, psychopathy, etc.). The results of the project may thus have important implications in such areas as education, health, and wellbeing.