The relationship between the breathing patterns of pianists and their physical movements while executing various performing tasks

Over the last fifty years, researchers have taken an interest in the breathing of musicians, studying the respiratory behaviours of wind players (Bouhuys, 1977; Cossette, Sliwinski, & Macklem, 2000), brass players (Shemann, 2000) and violinists (Stadler & Szende, 1965). Little is known on the breathing patterns of pianists, however. Two main studies have directly investigated the respiration of pianists (Ebert, Hefter, Binkofski, & Freund, 2002; King, 2006), looking at the relationship between meter, tempo, structure and physical movement and breathing while playing. Since it is not known whether a relationship exists between pianists' respiratory cycles and certain physical movements they make when playing, or between breathing and certain musical elements, the first goal of this study was to determine the observable relationship between breathing cycles and movement, rhythm, meter or phrasing of pianists performing various tasks on and off the piano. Additionally, the experiment investigated the effects of experience level on breathing patterns by studying novice, university-level and professional pianists. In order to better understand this relationship, four experiments were conducted where breathing patterns were measured by inductive plethysmography while participants carried out different tasks: 1) performed finger tapping - with and without an accent - on and off the piano at specific metronome speeds, 2) repeatedly played a C major scale and a C major arpeggio, 3) played a finger exercise transcribed in five different meters and 4) performed a piano piece. During the tasks, participants wore a respiratory effort sensor belt that measured inductance changes as the thorax and abdomen expanded and contracted with breathing. The data gathered from this apparatus was synchronized with the MIDI file

recordings of the various exercises performed. Data analysis allowed us to observe the relationships between breathing and finger or forearm movements caused by different musical elements during the various exercises (tapping, scale, arpeggio, exercise and score). The information obtained on the topic of breathing and pianists should be useful to piano teachers. From a pedagogical point of view, it was interesting to observe whether certain breathing patterns are common to advanced pianists, making them better performers and interpreters of the music. From a health standpoint, it could be beneficial to better understand the breathing of pianists to possibly prevent piano playing-related health injuries.