Aim and Objectives

Music and movement are inextricably linked in human nature, evident through the rich history of dance. In this paper we present results from an observational study of free dance movement to music. We believe that improvised dance allows for a unique perspective of sound and gesture relationships.

Context

In terms of the three gestural channel functions proposed in [1], dance movements are semiotic in nature and unique as communicative gestures. Choreographed dance and music have been coupled in many works, despite being very different modalities for expression. Nonetheless, Krumhansl and Schenk found subjects could detect structural and emotional similarities in the recording of the Divertimento No.15 by Mozart or the recording of the accompanying dance by Balanchine [2]. The gestures considered in this research, namely improvised movements to sound, are both expressive and also necessarily the result of the dancer’s musical perception. Similarly, the study of sound-accompanying or “mimicking” gestures is expected to uncover aspects of the mental representation of gesture-sound relationships as well as the more general perception of sound [3].

Methodology

Three students of modern dance were asked to move freely to five excerpts of non-tonal acoustic music. None of the dancers saw the others’ interpretations. The musical excerpts were each repeated three times. The majority of the excerpts were chosen to not have a salient pulse, thereby minimizing the influence of rhythm on resulting gestures.

The footage was annotated using the Anvil video annotation software [4]. Annotation was oriented towards choreomusical parallels [5]. We performed quantitative analysis of the video material obtained at the recording sessions using the Musical Gestures Toolbox, a set of tools for the Max/MSP/Jitter environment that allows for integrated audio and video analysis [6].

Results

The analysis of the videos revealed several findings. Although dancers were asked to freely interpret the piece, there were significant gestural similarities across their interpretations. Despite
the lack of rhythmic pulse in most of the musical excerpts, rhythmic surface features of the music figured largely in the subsequent gestures of the dancers. In particular, the density of the dancers movements roughly matched the density of the articulations in the excerpts, a surface feature as described in [7]. For example, the first musical excerpt consisted of long sustained woodwind notes. All three dancers responded to this through slow movements and extensions of the arms, as seen in Figure 1. Gestural similarities were also found in the interpretations of the fourth musical excerpt, which contained rhythmic violin attacks. All three dancers exhibited slashing movements with their arms, similar to the excitation gestures used to play the violin (Figure 2).

As would be expected, gestural changes seemed to temporally co-occur with visible changes in the spectral nature of the musical excerpts, as seen in Figure 3. Preliminary analysis of the footage using the Musical Gestures Toolbox has revealed similarities between low level features in the gestures and the spectral characteristics of the sound. Figure 4 shows how the Quantity of Motion in dancer A’s first interpretation of the second musical excerpt decreases along with the spectral brightness and energy.
Figure 3 An example of larger gestural ideas co-occurring with large spectral changes.

Figure 4 Plot of dancer A’s first interpretation of the second musical excerpt. Quantity of motion decreases along with spectral centroid and spectral energy. Values derived using Musical Gestures Toolbox.

Key Contribution
Results from this preliminary study suggest that improvised dance movements may share common characteristics from instrumental playing. Also, preliminary results suggest that further analysis into gestural and spectral relationships may prove fruitful. In general, this research is oriented towards a fuller understanding of the gestural modality by exploring its higher-level features and its relationship with sound.

Keywords
gestures, dance, improvisation, gestural analysis

References


