

T16G: Short Talks 16 - Improvisation

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Session Chair: John Anthony Sloboda

Visual Signals between Improvisers Indicate Attention rather than Intentions

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Background

Music performance is an inherently creative task requiring either interpretation of a score or improvisation of new material. During ensemble performance, creativity is distributed across group members as they combine their efforts to produce a cohesive performance. There has been some debate in the literature over the nature of the interpersonal interactions that take place during these tasks – when is explicit communication needed to coordinate individual intentions, and when does coordination unfold autonomously through a dynamical exchange of low-level sensory information? We study musicians' body movements and eye gaze patterns as they perform collaboratively in duos, either improvising or rehearsing from a score. Both tasks require cognitive flexibility and a willingness to accommodate variability in others' playing; however, the types of variability that should be expected are different (e.g., greater temporal variability is expected during performance of Western classical music than during jazz improvisation). The communication strategies that performers draw on may differ as a result.

Aims

This study tested the hypothesis that visual signals serve a primarily social function during jazz improvisation, helping performers monitor each other's attention. Gaze patterns were expected to relate to leader/follower roles and the turn-taking structure of improvised performances. During rehearsal of notated music, visual signals were expected to serve a similar social function, but to contribute to temporal coordination as well.

Method

Twenty pairs of classical musicians (playing clarinet or piano) and three pairs of jazz musicians (playing various instruments) rehearsed a new duet piece or performed a set of improvisations. Optical motion capture and mobile eye tracking were used to record their upper body and instrument movements and their eye gaze patterns. Eye gaze coordinates were then mathematically mapped to the motion capture space to allow automatic calculation of when and how often performers looked towards each other.

Results

Preliminary results suggest that jazz musicians rely minimally on visual signals to coordinate their improvisations. Performers look at each other often (compared to musicians performing from a score), but their glances do not relate to the structure of the improvisation. In contrast, classical musicians performing from a score exchange glances at predictable points in the performance. Their gaze patterns also reflect fluctuating leader/follower relationships. Analysis of performers' head and upper body movements (still ongoing) are expected to show that performers' movements are mutually influential.

Conclusions

Our findings show that visual communication is used to communicate attention and engagement during music ensemble performance, particularly during performance of notated music, when performers' glances towards each other occur at predictable points in the piece. Musicians tend to glance at each other's faces rather than bodies/instruments, suggesting that most glances serve a social function. Research on ensemble performance has already shown how performers monitor (and accommodate) each other's sound output; this study is expected to show how ensemble members monitor each other's participation in the interaction.

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