From Expert Model to Novice Performance

Can Experts Adapt to Novices' Faulty Timing in Joint Music Performance?

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Music interactions have increasingly been the focus of joint action research. Joint actions often require temporal coordination and joint music performance is an excellent example where the demands on the temporal coordination are especially high. Representing the outcome of a joint action [1] can drive internal models to predict timing and facilitate temporal coordination [2, 3]. In previous studies on expert-expert interactions familiarity with the partner's playing style led to better temporal coordination [4]. However, in expert-novice interactions experts would have to adjust their internal models to predict the non-optimal timing of novices. In the current study we raise the following questions: Are expert pianists able to adjust their temporal predictions to the faulty timing of a novice? What kind of information about the novice's contribution helps experts to do so?

Experts (more than 10 years of piano lessons) were asked to coordinate with performances of novice pianists (more than 5 years on another instrument). Before the coordination phase experts received information about the novice's contribution along the following two factors. In the Perception condition experts heard the novice perform her melody. This performance includes the idiosyncratic timing of the novice. In the Knowledge condition experts saw the prescribed outcome and prescribed movements of the novice in the form of sheet music. These two factors were realized in a within-subjects two-by-two design.

The data show that perception as well as knowledge led to better temporal coordination in the coordination phase. This means that experts were able to adjust their predictions to the faulty timing of a novice. However, depending on the current difficulty of the novice's contribution experts were able to use different kinds of information. When the novice did not shift her hand position experts produced lower asynchronies when they had perceived the novice's performance before than when they did not. When the novice had to change her hand position experts produced lower asynchronies when they saw the sheet music of the novice beforehand than without having had access to this information. As all manipulations were implemented in a phase in which the expert was not playing along, we can also conclude that experts were able to update their internal models outside of the interaction, in an offline manner.

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