

Music, Speech and a Theory of Mind: Investigations with a Computational Model of Musical Emotions

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In 2003 Juslin and Laukka provided the first comprehensive comparative analysis of the communication of emotion in speech and music performance. The investigation found a strong similarity both in the communication accuracy and the patterns of emotion rules used to express particular emotions. In an extension of these results, Livingstone aligned the previously collated structural music-emotion rules, those used by a composer to express emotion in a musical score, finding a 96% degree of 3-way agreement in the 100 entry rule set. The validity and weighted contribution of rules in the communication of emotion can be further examined through a computational model of music and emotion. Leveraging the dynamic music programming environment Impromptu, our music-emotion engine allows for the modification of structural and performative aspects of music in real-time. Preliminary results for influencing musical emotions through the modification of structural rules were encouraging, with an extended performative and humanising rule-sets progressing.

Isolating the contribution of component rules in music emotion can further inform cross-domain studies. With the identification of rule parallels in speech and music, (for example, fast tempo maps to fast speech rate); the leveraging of speech synthesis techniques could be similarly used to determine the contributive importance of rules in the communication of emotion in speech. A reciprocal process, locating similar levels of rule importance would further indicate an underlying multimodal, cross-domain form of emotional communication.