Learning by Ear: Multimodal listening and the Embodiment of Irish Traditional Music and Dance

In Irish traditional music and dance, listening to other encultured performers is understood as being vital in embodying key stylistic and aesthetic traits of the tradition. In this sense, listening forms part of the broader processes of learning by ear and includes in-person experiences, listening to recorded music, and in more recent times 'cross-modal' listening on platforms such as YouTube - which also provide contextualising visual information. Perhaps because traditional music is conceptualised as being an aural art form, and because different combinations of sensory information are present in each of the previously mentioned examples, 'listening' and 'watching' are often described as constituent parts of absorption, which can have the effect of separating the senses. As recent thought on listening has shown, any real-life listening event is multimodal, where auditory, visual, haptic and other sensory input combine in informing a coherent experience. Rather than being reactive, the listeners' internal model of this experience is predicted, based on their prior experiential knowledge of the same sensory input. As such, listening experiences are not universal and are instead shaped by individual enculturation. For musicians and dancers in particular, this process of embodiment is inherently multimodal and so creates a heightened association between sound (gesture) and physical gesture. From this, it follows that even 'monomodal' sources such as audio recordings, are listened to from a multimodal perspective, one which positively correlates with the experiential knowledge of the listener.

Introduction

Listening - as part of the broader processes of 'learning by ear' – is typically forwarded as being central to embodying key characteristics of performance practice and aesthetics in Irish traditional music and dance. In this regard, listening is directed towards the performance of encultured practitioners – whether that be in person or via recordings – and to the conversations that happen in and around performing, where practitioners impart their knowledge and views. These kinds of interactions are typified by an interview except with Cork fiddler Geraldine O'Callaghan featured in Cawley (2020):

'By sitting down and listening to a musician, learning by ear and imitation, you're aspiring to their music. As well as absorbing a tune, you're absorbing their love of it and their respect for it. You might be learning where they learnt it from, you learn a story that went with it, how they learned it, or the person that the tune is named after' (O'Callaghan in Cawley 2020, 19)

O'Callaghan's choice of the words 'listening' and 'ear' is representative of the type of language used in both the vernacular and in the literature, particularly in relation to the oral/literate question (Carson 1986, 6–7; Breathnach 1986, 9; Vallely 2011, 28; Cawley 2020, 150). This can have the effect of separating the senses, however, her overall description evokes an experience that goes beyond a purely auditory one, where visual information, interpersonal proximity, and setting also play a significant role. And in fact, as the Grove music entry on Oral traditions states, 'technically the term should be "aural/oral/visual/kinesthetic tradition," since the ear, the mouth, and/or the viewing and handling of an instrument are often used for this kind of music transmission.' (McLucas 2016).

Multimodal Listening

The recognition that 'different modes of meaning making are not separated but almost always appear together: image with writing, speech with gesture' led to a turn to multimodality in the mid-1990s when the 'strict "division of labour" among the disciplines traditionally focused on meaning began to be questioned'(Bezemer, Jewitt, and O'Halloran 2016, 2). Time constraints don't allow for the expansion on this topic in full, but it is relevant to briefly touch upon a definition of multimodal listening which comes from Ceraso (2014). Taking the position that sound is not experienced exclusively via a single sense, 'despite the deeply entrenched association between the ears and the act of listening' (Ceraso 2014, 102), this conceptualisation of multimodal listening aims 'to draw attention to listening as an expansive multisensory practice,' which 'alongside and in addition to semiotic approaches to multimodality, is necessary to address the affective, embodied, *lived* experience of multimodality in more explicit way,' since 'sound is often experienced via multiple sensory modes - it can be seen, heard, and felt.' As such 'multimodal listening encompasses both the semiotic and the embodied, sensory aspects of multimodal experiences,' which the author sees as 'significantly interconnected.' (Ceraso 2014, 104) While the vibrational quality of sound

contributes to this multisensory experience, Ceraso also points to the relationship between sound and visible movement and 'the strong connection between sound and vision that most people unconsciously rely on when listening' (2014, 109). Ceraso's understanding of multimodal listening forms the basis of a pedagogical approach to a listening practice that develops 'a heightened awareness of sound as an *ecological* event' (2014,109). This is based on the premise that listening habits are shaped by the accumulation, and quality of past experience, and so for example, habits built on a diet of exclusively low quality experiences (the author gives the example listening to music on laptop speakers) 'dull one's conscious sensory awareness' (2014, 110-1). On the other hand, experiencing the same music performed in a concert can have the effect of colouring future listenings on the same speakers since the listener has new contextual knowledge of what is absent (2014, 105-7).

Predictive coding of music model

The idea that past experience shapes a listening event is shared by the Predictive coding of Music (PCM) model. Predictive coding theory was first proposed by Friston (Friston 2002; 2005) and posits that the 'brain predicts the causes and sources of its internal states from... actual sensory input [bottom-up] as compared with previous "knowledge," accumulated through experience [top-down]' (Vuust and Witek 2014, 3). This is achieved via Bayesian inference, wherein the brain is essentially understood as a 'hypothesis-tester' that tries to minimise prediction errors (where bottom-up sensory information doesn't meet with top-down expectation) by constantly updating its predictive models (Vuust and Witek 2014). Vuust et al., have applied this framework to music perception in the predictive coding of music (PCM) model (Vuust et al. 2009; Vuust and Witek 2014; Vuust et al. 2018; Koelsch, Vuust, and Friston 2019). This model describes 'the process of listening to music, in which we continuously construct predictions of what happens next in a musical piece, and how this process gives rise to perception, action, emotion and, over time, learning' (Vuust et al. 2022, 287). The authors see the experience of music as being 'intimately linked to brain-bound predictive processes' since the patterns inherent in musical structure allow listeners to form expectations based on prior learning.' In this way the neural architecture that

generates musical expectation is shaped by 'culture, personal listening history and musical training' (Vuust et al. 2022, 289). As the model implies, even in a listening experience that only includes auditory information, the top-down predictive processes which are engaged, are shaped through prior knowledge, knowledge which is – at the very least - gained in part through multimodal experience and learning. In this sense learning can be both implicit -through exposure - and explicit – in the case of learning to perform - where the increased demands on audio-motor coupling heightens the precision of top-down predictions (Vuust et al. 2022, 301). For the musician and/or dancer, this means that a heightened association is created between sound (gesture) and the physical gesture that creates it.

Multimodal implicit/explicit learing, which both informs and is informed by the brain's predictive processing, is evident in Foley's account of embodying the north Kerry step dancing tradition from local dancers:

> In learning the steps, I visually, aurally and kinaesthetically imitated the movements of each dancer. The process involved them breaking down each step into small units. As I imitated their movements, I felt gravity dictating this style of dancing. I was drawn to the ground with each beat of the accompanying music - generally, our own lilting voices... My body felt grounded while I embodied and kinaesthetically practised this dance-music with my feet. The music flowed synchronically from the singing in my head through my centre and to my feet (Foley 2013, 93–94).

In the excerpt above, the multimodal experiences in which Foley 'visually, aurally and kinaesthetically' learned to imitate encultured dancers, resulted in a whole body audio-motor coupling – refined through practice- which was informed by the aesthetics of that tradition. Considering that this is a presentational percussive dance form, the movement of the feet, the position of the arms, and the posture of the dancer, are seen as the most salient expressions of this aesthetic. As such, these parts of the body and the way they are moved/held might seem like the visual aspects of the dancing style that are most consciously attended to, yet these movements don't happen in isolation. As Foley alludes to in her description of the 'singing in here head' (model of perception) flowing through her centre and out to her extremities, their successful execution depends on a whole body coordination (Jensenius et al. 2009, 26) which I argue forms

part of the gestalt of the aesthetic of a dancer's/musicians' gait, and thusly the multimodal listening experience as a whole.

Listening experience and prior experiential knowledge.

In applying the PCM model, it follows that listening experiences are not universal amongst listeners, even when attending to the same source. Instead, they are unique to the perceiver since perception is formed by the brain's internal predictive processes. Prior to learning to play an instrument or to dance, these processes are shaped exclusively by implicit learning, either through unconscious exposure, or a conscious absorption[1]. This active listening, and the level of detail in which a listening experience is perceived, is naturally refined when learning to articulate music and dance throughout the body as it builds a connection between the multisensory perception of performance, and the multimodal manipulation of the body which (re)produces it. Although audible sound is the most palpable component of musical experience, the kind of kinesthetic learning central to embodiment in aural/oral traditions is necessarily informed by the visual context of seeing other musicians perform. In idealised transmission contexts, this visual element forms part of a larger multimodal experience of music, since in observing, the learner can 'watch,' as well as 'listen.' However, this only accounts for the implicit learning that happens through absorption and not the additional explicit learning that results from attempting to express this acquired knowledge on an instrument – something which is mostly attempted during private practice. For the developing musician, explicit learning adds additional internally generated contextual information of the bodily gestures required to reproduce a musical gesture on their instrument. As such, the internal processes that generate musical perception are shaped by experiential cultural knowledge, acquired through a combination of implicit and explicit learning.

The potential makeup of this experiential knowledge, and thus its effect on perception, should also be considered in light of the 'strong dance basis of [the] tradition' (Ó Súilleabháin 1990, 123). In witnessing instrumental dance music and

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[1] These are terms commonly used in the literature and vernacular to describe learning.

dance performance together in context, experiential knowledge is implicitly coloured by the overt expressions of the music through the medium of dancing bodies. This is evident in Martin Hayes' description of 'good' set dancers in general, which he felt was epitomised by the dancing of Willie Keane:

> I loved good set-dancers. The best ones had their own style, they had personality in their dancing and they connected to the music – not just the basic rhythm but the flow of the melodic line itself...I remember many years ago...looking down from the stage at the set-dancer Willie Keane...he was music in motion and if you were wise enough to take a musical cue from him he'd show you where the heart of the groove really was (Hayes 2021, 97–98).

In Hayes' description the use of the words 'look' and 'watch,' highlight the ways in which action verbs most associated with single modalities are drawn upon when describing multimodal experience. While Hayes was certainly watching, his judgement of the musicality of dancers' movements was contextualised with audible sound – which both Hayes and Willie Keane also happened to be producing in this example since Willie Keane was one of the primary exponents of the Clare battering style - a highly percussive form of set dancing. Hayes' admiration for the dancing of Willie Keane is also relevant when considering that both musician and dancer came from county Clare and were exposed to very similar cultural influences.[2] As such, the 'complex relationship between factors such as musical training, culture, listening history, music-stylistic preferences' etc., (Vuust et al. 2022, 297) that lead to their individual enculturation would more than likely have produced overlaps in their aesthetic ideals of music/dance.

With the rise in the availability of commercial recordings - particularly since the 1970s - acousmatic listening[3] is commonly cited amongst musicians as the listening practice which contributes most to their enculturation. This is attributed to the fact that it allows for unlimited repeated listenings to the individual playing styles and repertoire of multiple musicians (Cawley, 2020). While this type of listening is described as disembodied, it also 'ironically highlights the significance of the body in musical

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[2] Although Martin Hayes is over 30 years younger, his father's generation of musicians – who were contemporaries of Willie Keane - were his biggest influences. He also regularly played with these musicians in the Tulla Céilí Band whose repertoire consisted of local dance tunes (Hayes 2021).

[3] 'hearing without seeing'; refers to listening to music via radio/CDs/streaming streaming services etc.

experience' by its absence (Kim and Gilman 2018, 6). This is especially true of the types of active listening and explicit learning which are crucial to the embodiment of music and dance. Purely acousmatic listening becomes most influential when a player has developed their musicianship beyond the point of basic technical proficiency and is more focused on expanding their repertoire and developing style. At this stage, although a musician is listening to music from a monomodal source, they are doing so with an embodied understanding of how – or at least how to go about - attempting to mimic the sound that is perceived on their instrument. Acousmatic listening is certainly relevant prior to reaching this stage, but only in the sense that it acts as an additional learning tool for the type of private practice that musicians would have undertaken, even prior to the wide availability of recorded music/recording technology. Such practice, where a learner develops instrumental proficiency through kinesthetic learning, is almost always informed by interactions with other musicians/dancers - be that related to specific techniques or performance practice in general. Cork fiddler Connie O'Connell, for example, spent much of this period learning repertoire from reel-to-reel recordings but couldn't play rolls until a fellow musician demonstrated the technique for him; 'I could hear the sound you see...I was asking what were they doing to make this sound. "Twas he showed me what a roll was, just showed me there and then. That's where I learned to do a roll"' (O'Connell in Randles 1998, 23). For Cawley, this kind of interaction 'highlights the meaningful social overlap between learning from a sound recording in private and learning in a ...real-world context (220, 56).' As she rightly points out, 'learners can only begin to imitate the sounds they hear, recognize and comprehend' and so the level of detail that a novice musician will perceive in a recording is markedly different to that of an expert (156).

Conclusion

The finer-grained listening of an expert musician - as compared to the that of non-musician- is attributable to the explicit knowledge acquired in learning to play an instrument (Vuust et al. 2022, 297). As such, the level of detail a musician perceives from a listening experience positively correlates with their development of culturally relevant instrumental proficiency. Listening experiences will not be perceived

universally by all listeners. Instead, as forwarded by the predictive coding of music model, an internal predictive model of this experience is generated based on prior knowledge of the effects of its multisensory input. This prior knowledge - akin to an internal database of experiential cultural knowledge - is defined by its plasticity and is selectively updated over time in order to minimize discrepancies between prediction and sensory input (Vuust and Witek 2014, 3). In the course of becoming an encultured performer, a musician both draws attention to, and minimizes these discrepancies to a greater degree than a non-musician. This is due to the explicit learning afforded by developing instrumental technique, which places 'heightened demands on auditory-motor coupling' (Vuust et al. 2022, 290–91) Even though two individuals might 'hear' an ornament in a performance, their 'listening' of that ornament will not be the same since a musicians' listening is also informed by an embodied knowledge of how/what it feels like to perform the same ornament on their instrument which draws attention to aspects of its performance that aren't necessarily obvious to a non-musician. This in turn influences a musician's musical expectations and thus their aesthetic judgement of the performance. Similarly, the expectations of a dancer listening to a musician play a tune will be influenced by an experiential knowledge that associates dance gesture with musical gesture articulated in a very specific way. Although a musician might play the correct tune type for a dance, at the approximately correct tempo, it can have the effect of 'sticking' a dancer to the floor rather than 'raising' them off of it, if it isn't articulated in the expected way.

Listening to audio recordings is often cited by Irish traditional musicians as the listening practice that has had the biggest influence on enculturation (Cawley 2020, 158). In order to affectively contribute to embodiment, the monomodal information gleaned from this type of listening necessarily needs to be supplemented with other contextualizing information, whether that be through watching encultured musicians perform or through the conversations that happen in and around musical performance. Once a musician reaches a certain level of proficiency, this contextualizing information begins to become less vital since an embodied association has been developed between musical sound and the physical gestures with produces that sound on their instrument. As enculturation continues, and implicit and explicit learning refines an

encultured practitioner's listening, even music emitting from a monomodal source is perceived from a multimodal embodied perspective.

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