**LITERACY THROUGH MUSIC**

***Maria Kay***

*(University of Aberdeen)*

**Introduction**

As music and language are both communication systems based upon sound, it is logical that they share commonalities. It is possible that the music of a language reflects the sounds of that language (Patel, 2010). It is also possible that both music (Blumenfield and Eisenfield, 2006; Winkler *et al.,* 2009 and Malloch and Trevarthen, 2009) and language (Curtiss, 1977) are innate. This innateness of both makes them ideal learning partners for young children.

Language acquisition offers a secure base for the development of literacy skills. Children with poor speech and language are at high risk of literacy difficulties (Roulstone *et al.,* 2011). Sosu and Ellis (2014) refer to the ‘attainment gap’ (the disparity between the attainment of children from poorer and richer backgrounds) and state that *‘children need solid foundations in early language and emergent literacy skills’*. There is evidence that children who have poor language skills and low-level pre-literacy skills are likely to be left behind (Tickell, 2011). There is a need for an intervention to support early language and literacy skills for struggling children. Where music and language skills can be promoted simultaneously they could be mutually supportive. The early years (zero to eight years of age) are the most formative and therefore a time when early intervention could have the greatest impact.

There is growing correlational evidence of the relationship between emergent literacy skills and those which can be promoted through participation in musical activities (Lamb and Gregory, 1993; Anvari, *et al.,* 2002; Bolduc and Montésinos-Gelet, 2005; Verney, 2011 and Banai and Ahissar, 2013). However, despite evidence of the relationship between the skills developed through musical activity and those required for literacy, the existence of any causal relationship is only suggestive. Music and literacy are separate domains and teaching a child to play a piano does not teach a child to read.

The holistic nature of music enables it to be naturally integrative, it is also naturally inclusive and musical activities can help to provide informal literacy learning opportunities. Given the close relationship between music and language and the many areas of overlap it is possible that musical activities could provide an ideal medium for the support and promotion of emergent literacy skills.

**Becoming Literate**

A basic dictionary definition of literacy is the ability to read and write, the National Literacy Trust adds speaking and listening to its definition (National Literacy Trust, 2014). However, the acquisition of literacy skills is a complex process, described by Ehri (2005: 168) as ‘*One of the great mysteries’.* Becoming literate is a holistic and non-linear process requiring the conflation of cognitive, language, motor, visual and auditory skills. In order to become literate children need to be able to encode, decode and comprehend text. This requires a multiplicity of skills and experiences plus knowledge as indicated in the diagram below:

Proficiency in literacy requires:

**Cognition**

Comprehension

Attention

Memory

Sequencing and Prediction

Rapid Automatized Naming



Experience to underpin emergent literacy skills

Communication, reflection, engagement with texts, understanding of and exploration of language, extension and enrichment of vocabulary through listening, talking, watching and reading. (Scottish Government, CfE Literacy and English experiences and outcomes, not dated)

Motivation

Motor Skills

Motivation

Experience to underpin emergent literacy skills

Communication, reflection, engagement with texts, understanding of and exploration of language, extension and enrichment of vocabulary through listening, talking, watching and reading. (Scottish Government, CfE Literacy and English experiences and outcomes) ND

Motivation

Whilst phonological awareness is identified as pivotal (Goswami and Bryant, 1990) and phonemic awareness as the most important of phonological awareness skills, (Muter, Hulme, Snowling and Taylor, 1997 and Nation and Hulme, 1997), other areas have also been highlighted as important and it may be the culmination of skills, knowledge and experience which ultimately facilitates literacy

The processing by the brain of sound is termed ‘auditory processing’ and is one which required for effective interpretation of the sounds in language. The perception of sound is a skill which develops from global to local (Brady and Shankweiler, 1991). Children are aware of large sound units such as whole words before their perception refines to an awareness of syllables, rhymes and phonemes. Brady and Shankweiler (1991) also found that the relationship between syllables, rhymes and phonemes in terms of sound perception is a linear one.

Conversely however, the teaching of reading follows a linear progression, involving local to global processing of phonological units. Children learn phonemes (the smallest units of sounds in words), then map them to graphemes (their written equivalent) and then learn to blend them together to make words. It is possible that where children have not yet reached the stage of being able to perceive the smaller units of sound in language, this may be a cause of difficulty when they are presented with synthetic phonic reading programmes upon school entry. The diagram below illustrates how children’s perception of sound may butt together with the beginning of formal literacy instruction.

Time

Blue = Sound perception development – large to small units

Red = Formal literacy instruction begins – small to large units

In this case children are able to process small units of sound and are ready to learn individual letter sounds. Where children have not yet developed the ability to process small units of sound they may be introduced to formal literacy instruction before they are able to comprehend that words are composed of smaller components of sound. This is illustrated by the diagram below:

Time

Blue = Sound perception development – large to small units

Red = Formal literacy instruction begins – small to large units

This then creates a gap in children’s progression such that comprehension of how word sounds can be broken up into letter sounds may be difficult. An intervention to facilitate the closing of the gap would seem helpful.

**The Importance of the Early Years for the Development of Emergent Literacy Skills**

The early years are the time when the brain is responding to experience and it has the greatest capacity to change, a condition scientists describe as ‘plasticity’. These years are therefore the most formative (Chugani, 1998). It is possible that children even begin to learn in vitro. Studies such as those of Rhodari (2008) and Lazarev (2010) confirm that music played to babies in the womb can be recognised after birth. It is recognised by the Scottish Government (Scottish Government and Donaldson, 2010:3) that ‘*Literacy development starts from birth*’. This refers to the fact that children are acquiring skills which will contribute to literacy achievement as soon as they are born. It is therefore vital that educators and parents provide the best possible learning opportunities and experiences for children during this period of extensive development.

Young children are active learners and there is concern that today’s children are becoming more sedentary than their predecessors and are spending increasing amounts of time indoors on inactive pursuits such as entertainment through electronic devices (Palmer, 2016). Tomporowski, *et al.,* (2011) suggested that regular exercise alters brain functions that underlie cognition and behaviour. There is increasing interest in the term ‘embodied cognition’, which recognises that the use of the body is an integral part of the cognitive process (McClelland, Pitt and Stein, 2014). Young children need to be engaging in physical activities such as movement to music.

**The Magic of Music**

Music offers a fun, social and interactive activity with which young children will readily engage. Musical activities can create a relaxed and supportive learning environment (Salimpoor, *et al.,* 2011) in which children can build confidence through play-based learning.

There is research evidence to support the many benefits of musical activities for children. Auditory stimulation, such as that through music, affects mood, which subsequently impacts upon the ability to learn (Savan, 1999). Music is motoric, and kinaesthetic learning is a strategy suited to many. Music is multi-sensory and participation in musical performance has been found to stimulate the use of synapses between the two hemispheres of the brain (Schlaug, *et al.,* 1995). Schlaug and colleagues also showed that musicians have larger corpora callosa (part of the brain which connects and communicates between the two halves) than non-musicians. There appear to be no negatives to participation in musical activities but a plethora of benefits.

Meyer, *et al.* (2014) found that even as little as half an hour of musical training could affect the brain such that it was able to use both hemispheres to work on a problem when prior to the music training it used only one. Additionally, music has been found to have shared mechanisms with language (Brandt, *et al.,* 2012). The work of Malloch and Trevarthen (2009) also illustrated that music is a natural method of communication between mothers and young babies. They urged educationalists to make greater use of this natural resource. Musical activities have also been found to assist the cognitive process and to help verbal memory retention and recall (Chan, *et al.,* 1998; and Ho, *et al.,* 2003). This myriad of benefits: physical and mental wellbeing, brain stimulation, assistance of memory and cognition, language promotion and social interaction, both impact upon and interact with each other to collectively support the ability to learn.

**Music and Literacy**

The many benefits of undertaking musical activities include the development of skills which overlap with those required for literacy – language, phonological awareness, the mapping of sounds to symbols, cognition and motor skills; music is also motivational. As expounded by Mithen (2005) music is inextricably linked with language, mind and body, thus it is able to offer a holistic learning medium.

There is little doubt that some of the skills required for literacy will transfer from those gained from participation in musical activities for many children. Many correlational studies attest to this (Anvari, *et al.,* 2002; Peynircioglu, *et al.,* 2002; Zuk, *et al.,* 2013 and Forgeard, *et al.,* 2008).

Gromko (2005) sought to show that the relationship between music instruction and phonemic awareness could be explained by a near-transfer hypothesis. The results of her study showed that active music making and the association of sounds with developmentally appropriate symbols may develop similar cognitive processes to those needed for segmentation of a spoken word into its phonemes. Research from Tierney and Kraus (2013) also suggested that this transfer of skills is due to the overlap between the perception and production of language and music. They also suggest that reasons for the benefits derived from musical training are that music is rewarding, emotion-inducing and attention-grabbing. Causal evidence remains elusive.

A study by Moreno, *et al.* (2011) led the researchers to believe that transfer of skills between music training and pre-literacy skill demonstration occurred at a cognitive level due to direct parallels in the cognitive processing required for music processing and the pre-literacy skills tested. The study also provided preliminary causal evidence of the effect of music training on the promotion of pre-literacy skills, in terms of linguistic abilities. The lack of any further causal evidence would suggest that the correlation between music and literacy is not fully understood.

One way to obviate the need for skill transfer from music to emergent literacy skill development is to integrate the two disciplines. To date such programmes are described as musical. For example, Standley and Hughes (1997) designed two musical programmes, one to enhance pre-reading skills and one to enhance writing skills. The programmes incorporated techniques from music therapy and the musical activities included alphabet letters names and sounds, language instruction, stories, visual awareness, word reading and book handling. In addition to significantly enhancing print concepts and prewriting skills the researchers reported that the music activities were enjoyed by the children which possibly lead to long term motivation for further academic progress. Music and literacy activities were very much integrated.

The benefits of musical activities to early years children are clear and plentiful. Evidence of the correlation between music training and literacy learning is also proliferating. Standley, (2008) suggested that literacy should be embedded into music activities and states that this is a ‘*professional speciality of the music therapist’* (p29). Literature from Kay (2013) and Hansen, *et al.* (2014) illustrate how literacy teachers may integrate music and literacy to promote the development of literacy skills. The teaching of literacy skills should not be a by-product of a music programme; the focus of literacy teaching must be literacy.

The use of music in itself is not causal to the promotion of emergent literacy skills; the literacy element teaches the literacy output (Verney, 2011). Where music and literacy teaching is combined this may well have a causal effect upon literacy learning. Piasta and Wagner (2010) suggested that this could be the case in their study of three and four-year old children. They found that letter name training when combined with sound instruction may have causally impacted upon pupils’ letter sound acquisition.

Bringing together music and emergent literacy skill teaching in the early years such that a compound is created which is literacy in focus but musical in nature could serve to improve children’s early experience and skill development.

**Summary**

Whilst it is well evidenced that undertaking musical activities can impact upon emergent literacy skill acquisition there is less evidence of the impact of integrated interventions and a dearth of research evidence from a literacy perspective.

It is possible that interventions which use musical activities to deliberately promote and support the development of emergent literacy skills will confer all the benefits of participation in music whilst also delivering vital early literacy skill training in a playful and inclusive environment. Such interventions may also help to identify those at risk of language learning problems and prevent and ameliorate future reading difficulties (Zuk, *et al.* 2013).

Using music as a learning medium engages both hemispheres of the brain, encourages movement which further stimulates the brain, offers language opportunities and a stimulating environment. Malloch and Trevarthen’s advice (2009) to make greater use of this natural resource is to be heeded and integrating music with early literacy programmes could provide a valuable resource for early years children.

**References**

**Anvari, S. H., Trainor, L. J., Woodside, J. and Levy, B. A.** (2002) Relations among musical skills, phonological processing and early reading ability in preschool children. *Journal of Experimental Child Psychology*, **83**, pp.111-130

**Banai, K. and Ahissar, M.** (2013). Musical Experience, Auditory Perception and Reading-Related Skills in Children. PLoS ONE, **8** (9).

**Blumenfeld, H. and Eisenfeld, L.** (2006). Does a Mother Singing to her Premature Baby Affect Feeding in the Neonatal ICU? *Cinical Pediatrics,* **45,** pp.65-70.

**Bolduc, J. and Montésinos-Gelet, I.** (2005). Pitch processing and phonological awareness. *Psychomusicology*, **19** (1), pp.3-14.

**Brady, S. A. and Shankweiler, D. P.** (1991). *Phonological processes in literacy: A tribute to Isabelle Y. Liberman,* pp.5-27. Hillsdale, NJ: Erlbaum.

**Brandt, A., Gebrian, M. and Slevc, L. R.** (2012). Music and early language acquisition. *Frontiers in Psychology*, **3**:327. DOI:10.3389/fpsyg.2012.00327.

**Chan, A. S., Ho, Y. and Cheung, M.** (1998). Music training improves verbal memory. *Nature*, **396**, p.128.

**Chugani, H. T.** (1998). A Critical Period of Brain Development: Studies of Cerebral Glucose Utilization with PET. *Preventative Medicine,* **27**, pp.184-188.

**Curtiss, S.** (1977). *Genie: A Psycholinguistic Study of a Modern-Day “Wild Child”*. New York: Academic Press Inc.

**Ehri, L. C.** (2005). Learning to Read Words: Theory, Findings and Issues. *Scientific Studies of Reading,* **9** (2), pp.167-188.

**Forgeard, M., Winner, E., Norton, A. and Schlaug, G.** (2008). Practising a musical instrument in childhood is associated with enhanced verbal ability and non-verbal reasoning. *PLoS One,* **3** (10), e3566.

**Goswami, U. and Bryant, P.** (1990). Phonological Skills and Learning to Read, Essays in Developmental Psychology, Hove: Psychology Press Ltd.

**Gromko, J. E.** (2005). The Effect of Music Instruction on Phonemic Awareness in Beginning Readers. *Journal of Research in Music Education,* **53**, pp.199-209

**Hansen, D., Bernstorf, E. and Stuber, G. M.** (2014). *The Music and Literacy Connection*, 2nd ed. Lanham: Rowman and Littlefield.

**Ho, Y., Cheung, M. and Chan, A. S.** (2003). Music training improves verbal but not visual memory: Crosssectional and longitudinal explorations in children. *Neuropsychology*, **17** (3), pp.439-450.

**Kay, A. M.** (2013). *Sound Before Symbol: Developing Literacy through Music*. London: SAGE Publications.

**Lamb, S. J. and Gregory, A. H.** (1993). 'The Relationship between Music and Reading in Beginning Readers'. *Educational Psychology*, **13** (1), pp.19-27.

**Lazarev, M.** (2010). *Mamababy: Birth Before Birth.* North Charleston: CreateSpace.

**Malloch, S. and Trevarthen, C.** (2009). *Communicative Musicality; Exploring the basis of human companionship.* Oxford: Oxford University Press.

**McClelland, E., Pitt, A. and Stein, J.** (2014). Enhanced academic performance using a novel classroom physical activity intervention to increase awareness, attention and self-control- Putting embodied cognition into practice. *Improving Schools*, **1**:18. DOI:10.1177/1365480214562125.

**Meyer, G. F., Spray, A., Fairlie, J. E. and Uomini, N. T.** (2014). Inferring common cognitive mechanisms from brain blood-flow lateralization data: a new methodology for fTCD analysis. *Frontiers in Psychology*, **5**:552. DOI:10.3389/fpsyg.2014.00552.

**Mithen, S.** (2005). The Singing Neanderthals: The origins of music, language, mind and body. London: Weidenfeld & Nicolson.

**Moreno, S., Friesen, D. and Bialystok, E**. (2011). Effect of Music Training on Promoting Preliteracy Skills: Preliminary Causal Evidence. Music Training and Preliteracy Skills, **29** (2), pp.165-172. DOI:10.1526/mp.2011.29.2.165.

**Muter, V., Hulme, C., Snowling, M. and Taylor, S.** (1997). Segmentation, Not Rhyming, Predicts Early Progress in Learning to Read. *Journal of Experimental Child Psychology,* **65**, pp.370-396.

**Nation, K. and Hulme, C.** (1997). Phonemic segmentation, not onset-rime segmentation predicts early reading and spelling skills. *Reading Research Quarterly,* **32**, pp.154-167

**National Literacy Trust,** (2014). *State of the Nation and Impact Report 2013/2014*. Available: http://www.literacytrust.org.uk/assets/0002/3989/National\_Literacy\_Trust\_-\_State\_of\_the\_Nation\_and\_Impact\_Report\_2013-2014.pdf

**Palmer, S.** (2016). Why the iPad is a far bigger threat to our children than anyone realises: Ten years ago, psychologist SUE PALMER predicted the toxic effects of social media. Now she sees a worrying new danger… *Mail Online*. Accessed: http://www.dailymail.co.uk/femail/article-3420064/Why-iPad-far-bigger-threat-children-realises-Ten-years-ago-psychologist-SUE-PALMER-predicted-toxic-effects-social-media-sees-worrying-new-danger.html [Date accessed: 24th March 2016]

**Patel, A.** (2010). *Music, Language and the Brain.* Oxford: Oxford University Press.

**Peynircioglu, Z. F., Durgunoglu, A. Y. and Oney-Kusefoglu, B.** (2002). Phonological Awareness and Musical Aptitude. *Journal of Research in Reading*, **25**, (1), pp.68-80. EJ642831.

**Piasta, S. B. and Wagner, R. K.** (2010). Learning Letter Names and Sounds- Effects of Instruction, Letter Type, and Phonological Processing Skill. *J.Exp.Child.Psychol*, **105** (4), pp.324-344. DOI:10.1016/j.jecp.2009.12.008.

**Rhodari, J.** (2008). *Infant Musicality*. London: Ashgate.

**Roulstone, S., Law, J., Rush, R., Clegg, J. and Peters, T.** (2011). The role of language in children’s early educational outcomes. *Research Brief. DFE-RB 134*, ISBN 978-1-84775-945-0

**Salimpoor, V. N., Benovoy, M., Larcher, K., Dagher, A. and Zatorre, R. J.** (2011). Anatomically distinct dopamine release during anticipation and experience of peak emotion to music. *Nature Neuroscience*, **14** (2), pp.257-264. DOI:10.1038/nn.2726.

**Savan, A.** (1999). The Effect of Background Music Upon Learning, *Psychology of Music*, **7** (2), pp.138-146.

**Schlaug, G., Jäncke, L., Huang, Y., Staiger, J. F. and Steinmetz, H.** (1995). Increased corpus callosum size in musicians, *Neuropsychologica*, **33** (8), pp.1047-1055.

**Scottish Government and Donaldson, G.** (2010). *Teaching Scotland's future- Report of a reveiw of Teacher Education in Scotland*. Edinburgh: Crown Copyright.

**Sosu, E. and Ellis, S.** (2014). *Closing the Attainment Gap in Scottish Education*. York: Joseph Rowntree Foundation.

**Standley, J. M.** (2008). Does Music Instruction Help Children Learn to Read- Evidence of a Meta Analysis. *Applications of Research in Music Education*, **27** (1), pp.17-32.

**Standley, J. M. and Hughes, J. E.** (1997). Evaluation of an early intervention music curriculum for enhancing pre-reading/writing skills. *Music Therapy Perspectives,* **15**, pp.79-85.

**Tickell, C.** (2011). *The early years: foundations for life, health and learning - Tickell review*. Available: http://www.education.gov.uk/tickellreview [Date Accessed: 25th January 2016].

**Tierney, A. and Kraus, N.** (2013). Music Training for the Development of Reading Skills. In: M. Merzenich, M. Nahum and T. Van Vleet, eds, *Progress in Brain Research*, pp.209-241. Burlington: Academic Press.

**Tomporowski, P. D., Lambourne, K., and Okumura, M. S.** (2011). Physical activity interventions and children’s mental function: An introduction and overview. *Preventive Medicine*, **52** (Suppl.), pp.3-9.

**Verney, J. P.** (2011). *Rhythmic Perception and Entrainment in 5-Year­Old Children- An Exploration of the Relationship between Temporal Accuracy at Four Isochronous Rates and its Impact on Phonological Awareness and Reading Development*. Thesis, (DrPhil), The Faculty of Education, University of Cambridge. Cambridge.

**Winkler, I., Haden, G., Ladinig, O., Sziller, I. and Honing, H.** (2009). Newborn infants detect the beat in music. *Proceedings of the National Academy of Science*s. Available: www.pnas.org/content/106/7/2468.full [Date accessed: 20th May 2012).

**Zuk, J., Andrade, P. E., Andrade, V. C. A., Gardiner, M. and Gaab, G.** (2013). Musical, Language and reading abilities in early Portuguese readers. *Frontiers in Psychology*, **4**:288. DOI:10.3389/fpsyg.2013.00288.