



Transforming young lives through the arts



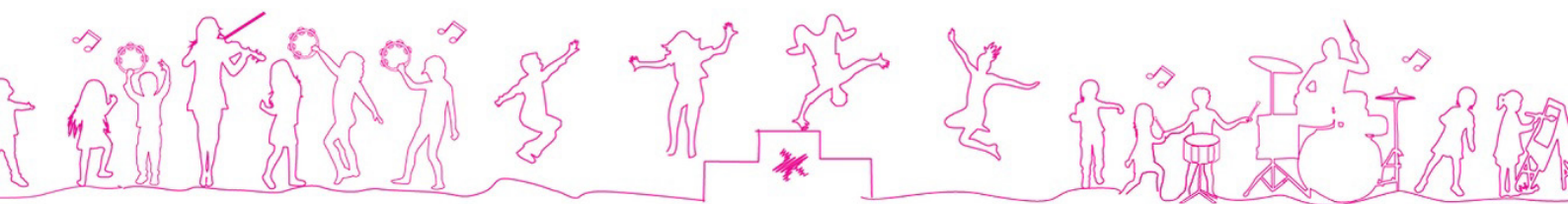
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Institute of Education

ACT SING PLAY

A review of the research evaluations



ACT SING PLAY

Introduction

Creative Futures is a multi-arts charity which **transforms the lives of children and young people**, especially those from disadvantaged backgrounds, through fun and engaging arts activities which aim to **boost learning and self-esteem**. We work with experienced and inspiring artists to deliver our programmes and engage researchers to assess the impact of our work where we can.

In 2012 Creative Futures approached the Education Endowment Foundation (EEF) to replicate a study carried out by Professor Schellenberg (*“Music Lessons Enhance IQ”, Toronto, 2004*) which suggested that music tuition improves the IQ of children. Act Sing Play, a random control trial, retained many of Schellenberg’s parameters, whilst transferring his self-selecting after-school study to an in-school whole-class environment across multiple English primary schools in line with the EEF’s interest in exploring what type of activity breaks the link between socio-economic disadvantage and children’s poor academic attainment.

Act Sing Play was delivered in 19 primary schools across 4 different areas of England during the 2013-14 school year, and involved **over 900 Year 2 children**. It was assessed by two independent research teams, one from the National Centre for Social Research (NatCen), engaged by the EEF to assess the programme’s impact on literacy and numeracy attainment, and one from the UCL Institute of Education (IOE), engaged by Creative Futures to assess musical progression and outcomes such as learner identity.

Background: evidence review

The IOE research team, led by Dr Jo Saunders, carried out an evidence review during the project planning stage in order to inform the programme’s delivery design and research methodology. Below are extracts from this review which focussed on the notion that engagement in musical activity has a ‘transfer effect’ to other areas of cognitive function such as literacy, numeracy and memory.

“Musical experience and education (broadly conceived to embrace formal, non-formal and informal contexts) involve a number of attributes that may prove beneficial for other areas of cognition and learning, such as daily practice, periods of sustained attention, memorisation of musical passages, reading musical notation, on-going mastery of technical skill, and learning about conventions that govern musical structure and the expression of emotions in performance (cf Schellenberg, 2004). Research has evaluated possible ‘transfer’ effects of sustained musical experience (including training)

by investigating broad cognitive abilities such as intelligence and reading skills (whilst recognising that these are socio-located and socio-culturally defined), as well as more specific domains, including auditory imagery, creativity and visuospatial abilities, in both children and adults.

Although the underlying neural mechanisms are complex and difficult to lineate clearly, there is an emergent body of research that suggests that sustained and focused musical experience, such as involved in instrumental learning, can provide benefits for the development of cognitive abilities in a range of domains and modalities.

Music embraces a spatio-temporal domain that engages both hemispheres and processes structural and temporal information together and, according to Hargreaves and Aksentijevic (2011), it is the complexity of this processing that facilitates the association between musical training and general intelligence.

Research suggests that some of the skills used in language processing are similar to those used in music perception (Lamb and Gregory, 1993). The domains involved in the acquisition of both language and music share common features: both are auditory, highly patterned and internally consistent (Saffran, 2003). Neuropsychological evidence suggests that speech and music may share some cortical areas and mechanisms (Patel and Peretz, 1997; Patel 2011). Findings such as these have motivated research into the effects of musical instruction on reading abilities. Butzlaff (2000) claims there are a number of reasons as to why sustained and focused musical experiences may improve reading abilities in children. Firstly, both music (in part) and reading involve formal written notation, which is read from left to right, and involves the mapping of written symbols to specific sounds. Secondly, both domains develop auditory sensitivity; reading skills require sensitivity to phonological distinctions, while music skills require sensitivity to tonal distinctions. Furthermore, reading song lyrics results in an engagement with written text. As song lyrics are often predictable and repetitive, they may provide opportunities to develop reading skills using an alternative approach. To test this, Butzlaff (2000) conducted two meta-analyses of empirical studies to investigate the association between musical instruction and reading abilities. A meta-analysis of 29 correlational studies suggested a significant, positive correlation between musical instruction and standardised reading test scores. However, although there is evidence for a relationship between music and reading, no causal conclusions can be drawn from correlational research.

There is empirical and neuroscientific evidence to suggest that there is cognitive transfer from musical learning to mathematical learning. Several empirical studies from the late 1990s report a correlation between a pupil's musical learning and their mathematical skills. For example, Gardiner et al. (1996) designed a study with pupils achieving lower scores in mathematics than their peers.

After nine months of structured musical experience, the pupils had exceeded the control group's scores. Cheek and Smith (1998, 1999) reported that pupils participating in instrumental tuition for two years or longer achieved higher marks in a standardised mathematics test than peers with no musical tuition or less than two years.

The benefits of music can extend beyond cognitive abilities, to social and emotional domains (Hargreaves and Aksentjevic, 2011). According to Gerry, Unrau and Trainor (2012), musical acquisition, cognitive development and social interaction do not act as isolated systems.

In an experiment involving 6-month olds, Gerry, Unrau and Trainor (2012) demonstrated that active music classes in infancy enhanced musical, communicative and social development. Infants were randomly assigned to two groups; active music, where they attended a one-hour interactive music class, or passive music, where they were exposed to background music during play.

Those assigned to the active group showed lower levels of distress and superior social and communicative development than those in the passive group. Although this does not provide direct evidence for improved cognitive abilities, social and communicative development facilitates learning in other domains.

The nature of cognitive transfer and the context within which it can occur have been the subject of considerable theoretical and empirical research for the past century (Barnett and Ceci, 2002). Practically, the outcome of musical transfer research can be relevant in the implementation of educational programs and development of curriculum frameworks. This paper has reviewed the far transfer effects of structured musical experience to domains as broad as general intelligence and reading abilities, and as specific as phonological awareness, verbal memory, auditory imagery, creativity, emotional processing, linguistic pitch encoding and visuospatial abilities. Underlying mechanisms have been proposed, including sharpened basic auditory circuitry, superior encoding and more precise tuning of brainstem responses, better imagery representations in cortical auditory areas, increased cortical frontal activity, improved sensorimotor integration, and more balanced hemispheric processing through enhanced IHTT. Fundamentally, research consistently shows that musical training benefits the development of cognitive abilities in a range of domains and modalities, with effects being more pronounced and long-lasting with more extended periods of musical training”

Programme outline

Act Sing Play was delivered in 19 primary schools from the London Borough of Hounslow (4), Essex (7), East Sussex (3) and Coventry (5) during the 2013-14 school year. Schools were selected by Creative Futures in collaboration with the Music Education Hubs in each area, who helped identify schools that met our criteria and that would be supportive of the programme. We also worked closely with the Hubs on aspects of the programme's delivery,

engaging many of their instrumental and vocal teachers as tutors on the project.

Act Sing Play sought to implement a similar concept to Schellenberg's 2004 study, but with key differences. These included: (i) all participation was to take place during the school day (thereby reducing the potential for participating children to be those with caregivers who already value the arts); (ii) participation would be at no cost to the pupil, family or participating school; (iii) participation would involve all pupils within a class cohort, irrespective of individual educational needs; (iv) the number of participating children in each treatment condition would be increased from 6 to 10; and (v) there would be no 'passive control' group (ie all groups were allocated to an activity so as to ensure equity of access).

Within each class, pupils were randomly allocated to the three activities: musical instrumental tuition (involving either violin or cello: both instruments being taught in the same session), vocal tuition (loosely based on the Kodaly method), and drama (being the 'active control' activity). Pupils remained in their allocated groups throughout the year. Groups varied in size from 6 pupils in the smaller schools to as many as 15 in the larger ones. Most groups consisted of 10 pupils.

32 weekly sessions lasting 45 minutes were scheduled in each school, with strings, vocal and drama sessions being delivered simultaneously for each class so as to minimize curriculum disruption.

Delivery and Curricula

The practitioners delivering the programme were freelance tutors sourced by Creative Futures and tutors employed by their local Music Education Hubs and contracted to deliver the project. In total, 32 practitioners were employed to deliver the programme (13 strings, 9 vocal and 10 drama practitioners). Some taught across more than one primary school, and some practitioners taught more than one of the strands (i.e. strings and vocal sessions). All of the practitioners had previous teaching experience although for some of the strings tutors this may have been predominantly in small group or 1:1 teaching rather than whole class teaching. Each tutor attended a three-hour introductory session designed to introduce both the aims and curricula of the programme. There was an expectation that while the curricula would form the meta-structure of the programme (indicating learning goals and pedagogical approaches) individual practitioners would, in addition, use their professional knowledge and experience so as to be sensitive to the needs and demands of their pupils and their learning contexts. Each pupil in the string subgroup was allocated an instrument (either violin or cello) in an age appropriate size for the duration of the programme.

String practitioners worked with a curriculum that identified learning objectives for each term, eg learning objectives in the first term included discovering and using the singing voice, explore vocal range and tuning, demonstrating musical memory, distinguishing pulse from rhythm and performing a rhythmic ostinato. The key text was 'Fiddle Time Starters' (*Blackwell K. & D., Oxford University Press, 2012*) with each participating pupil receiving their own copy. In addition, each string practitioner received a set of supplementary activities. String practitioners were encouraged to use their established pedagogy to respond to the needs of the pupils and meet the termly goals, although some specified activities were strongly advised so as to ensure a degree of continuity across the string provision.

Vocal practitioners worked with a curriculum based loosely on the Kodaly method, with elements of Dalcroze, in which pupils were encouraged to develop their musical skills through singing, listening and movement. Learning objectives were given (eg in the first term these included: discovering and using the singing voice, explore vocal range and tuning, demonstrating musical memory, distinguishing pulse from rhythm and performing a rhythmic ostinato). Assessment criteria were also suggested, for example, for the learning objective that the pupils should 'show and feel the beat' the assessment criterion was to 'experience and learn about the pulse in music and to speak rhythmically and show the beat in various ways'. Practitioners were provided with vocal and physical starter activities, warm-ups, a variety of learning opportunities and the song resource book *Banana Splits* (*Sanderson, A; A&C Black, 1995*). In addition, they were encouraged to use their professional knowledge in relation to their own pupils and reflect upon the extent to which objectives were achieved.

Drama practitioners were provided with a framework based around six specially adapted stories, each lasting for between four and six weeks. The titles of the stories included 'The crashed spaceship', 'The orchid hunters', 'The snow queen', 'Women of the seas', 'Daedalus and Icarus' and 'The Giant's new coat'. The curriculum was designed to build pupil confidence, communication skills, focus, imagination and thinking skills. Suggested activities and approaches were given. Activities involved improvisation, tutor narration, discussion and physical games. As with the other subjects, drama practitioners were encouraged to be flexible in terms of their approach and response to their pupils.

Although the provision of a meta-structure curriculum for each of the subgroups would have established some common goals, activities and content across the Act Sing Play programme, the necessary respect for the craft knowledge of the individual practitioners and their own artistic responses to their pupils required a degree of flexibility that should be considered a cornerstone of effective teaching.

Research design

Two distinct strands of research were commissioned to assess the outcomes of this project:

1. NatCen was commissioned by the EEF to evaluate whether music workshops (both strings and vocal) had a greater impact than drama workshops on pupils' maths and literacy attainment; and to conduct a process evaluation of the project. The evaluation tools used were standardised maths and literacy PIPS tests (development by Durham University). Participating pupils took the pre-test in July 2013 (at the end of their Year 1 of primary school) and the post-test in June/July 2014 (at the close of the intervention at the end of Year 2).

2. UCL Institute of Education (IOE) was commissioned by Creative Futures (i) to measure the impact of the music components of the Act Sing Play programme on the musical development of the participating pupils using established vocal assessment tools (*Welch et al., 2009, 2011, 2014*) for pupils in vocal groups, and a tutor-led tool for instrument learners; (ii) to measure the extent to which participation in any one of the three strands impacted upon pupil's perceptions of themselves in relation to wider aspects of their school experience using a 7-point Likert scale pupil questionnaire covering aspects of musical identity, learner identity and self and social inclusion; and (iii) to explore aspects of effective practice amongst the strings and vocal practitioners delivering the programme through observational assessments.

In addition, Creative Futures carried out a post-project evaluation with tutors, class teachers and head teachers involved in the programme.

Security Rating: The EEF awards all its programmes a security rating, scored out of 5, and Creative Futures is pleased to report that **Act Sing Play was awarded a very good rating of 4 padlocks**, meaning that findings from Act Sing Play have a high degree of security with a good balance of pupil characteristics between the group receiving music workshops and those receiving drama workshops (the control group); low attrition of 10% and no evidence that systematic attrition had biased the results.

Summary of key findings

i. Attainment in Literacy and Numeracy (music vs drama)

This Random Control Trial evaluation found no evidence that the Act Sing Play music workshops had a greater impact than the Act Sing Play drama workshops in terms of maths

or literacy attainment. Although small effects (positive and negative) were identified during the analysis, it could not be concluded that these effects were anything other than random chance. Each of the two different types of music workshop (strings and singing) was also analysed separately. As was the case with the main analysis, neither strings nor singing workshops showed evidence of out-performing drama workshops in advancing maths or literacy attainment. *(NatCen/EEF report, 2015.)*

ii. Singing

The mean singing assessment scores at pre-intervention would suggest that vocal development was at a very early stage for many of the Year 2 pupils involved in the project. Following matched pair comparisons of pre-intervention and post-intervention assessments of the pupils who took part in the Vocal subgroup, **statistically significant improvement was evidenced** at song singing in post-intervention measures. *(IOE, 2015.)*

iii. Instrumental music

The instrumental tutors' assessment of musical behaviours show that **pupils made significant progress** on their instruments throughout the duration of the Act Sing Play programme. *(IOE, 2015.)*



“The children are now **spontaneously bursting into song** and either clapping the rhythm or the beat”

- Tutor



“[pupils involved in the strings sessions] **achieved** what they initially thought was **impossible**”

- Head teacher

“It has been **specially wonderful** to see the children perform in our whole school music assemblies. I will remember the astonishment of one set of parents when I told them their daughter showed promise with the violin. **She is now taking extra tuition**”

- Head teacher

iv. Self confidence and enjoyment

The process evaluation suggested that pupils **enjoyed** participating in the programme, and were **engaged**. Teachers reported that some pupils' **confidence and social-skills improved**

during the programme. Teachers also felt it was important that children from disadvantaged backgrounds had the opportunity to learn a new skill that they might otherwise not be able to access. (NatCen/EEF report, 2015.)

v. Learner identity

The analyses of the pupils' attitudinal and self-identity questionnaires suggest that the Year 2 pupils were **broadly positive** about all of the aspects of their school and musical lives and that this positivity was maintained throughout the year. (IOE, 2015)



“I know those children got a lot from the project, things that are immeasurable: the **confidence, happiness and engagement** that you can see through observation. They were working in small groups with specialists on fun learning; **proper learning, but fun**. Those things will have **long-term impact**. Even ‘**I feel good about myself, I’m going to get myself to school today**’ can be a huge step”

- Interview with deputy head teacher

vi. Flexibility of the curricula

Interviews with school staff and workshop tutors suggested that there were differences in the way the programme was implemented by different tutors, reflecting the flexible nature of the programme. Tutors valued the ability to choose flexible approaches to music tuition. However, the process evaluation suggested that some tutors—particularly those with less experience of teaching groups of primary school children—needed more guidance on how to run their sessions. This led to related concerns that in some of the strings workshops, it was a struggle to keep students on task. (NatCen/EEF report, 2015.)



“I feel much more **confident** about teaching KS1 pupils in music lessons now. Stripping the music theory right back to basics, and then seeing how the basic concepts of beat, rhythm and pitch can be built up, has been very helpful. **I have been amazed at the progress some of the students have made** in terms of tuning and recognising musical patterns”

- Tutor

vii. Pupils with English as an Additional Language (EAL)

Although the research evaluations did not specifically examine the impact of the programme on EAL pupils, feedback from some tutors and teachers involved suggested that the singing in particular helped them with their language skills.



“The repetition and re-visiting of songs was **really helpful** for several of my children for whom English was their second (sometimes unfamiliar) language. **It helped them to shine once a week**, when often they were confused in other lessons as they struggled to keep up with vocabulary”

- Tutor

viii. Enhancing the skills of the workforce

Feedback from the tutors involved in the project was universally positive with **70%** (of the 23 tutors who responded) **scoring 5 out of 5** to the statement “**I have learned new skills as a result of delivering the project**”, and **77% scoring 4 or more out of 5** in response to the statement “**the curriculum met my needs**”. **More than 90% reported that Creative Futures had supported them well through the project and managed the programme well** (scoring 4 or more out of 5). One tutor went on to train to be a primary school teacher as a direct result of her experience of delivering this programme. Many tutors reported that the work has changed their teaching approach or given them new strategies and tools. In this way the project has succeeded in providing a **valuable source of professional development** for many music and drama tutors across the country.

Extract from strings session observation

IOE report, 2015

“The practitioner welcomed the pupils into the large teaching space and immediately the pupils prepared themselves to play. This was an ensemble opportunity, with string groups from two classes brought together to rehearse for an end of project performance. The richness of the sound brought the class teachers back from their tasks to listen to their pupils. The practitioner was meticulous in their presentation of musical material. They played and simultaneously sang (or chanted) the note names at the appropriate pitch and moved to the pulse of the music. Gestures were bold and dynamic. They were repeated frequently, underlining good technique at all times. Strong links were

immediately established through a series of closed questions – these were sometimes part of a one-sided dialogue to model an invisible thought process. ‘Where is my first finger?’ ‘Does that sound quite right?’ ‘What should I do?’ ‘What should it sound like?’ ‘Can I sing the note I need?’. Later, as the pupils warmed to the learning context they chanted along as they problem solved for themselves. They were applying the scaffolding technique, and, in turn, helping their peers around them. As the lesson progressed, the practitioner deepened the learning to include the note names and relevant musical vocabulary, symbolisation and foreign terminology, but returned to the beginning of the process to consolidate learning for those that need additional support.

The level of active engagement and playing by both pupils and practitioner was high. As an ensemble, they entered into a period of extended rehearsal where short activities were looped so as to rehearse and embed musical memory. The practitioner played and sang throughout, ‘I play, you play’ setting instrument groups in flow so that the musical output was enriched by sections working in harmony.

Bows began to rise and fall together and pupils noted to one another when their actions were ‘out of time’. There was pride when the movements were synchronised. Links were made to other orchestras and the need to work as part of a team. Praise was peppered throughout the session, tightly linking progress, feed forward (formative assessment that enables the learner to immediately act upon it) and the consolidation of skills. Time was made for simple activities to be done well, and, through this process, instil a sense of achievement in the pupils. Short breaks were taken to rest tired arms and enable pupils to feed into the process. ‘What do we need to improve?’ ‘What can we do to make it sound better?’ The pupil’s ideas were woven into the next activity communicating that their opinions were explicitly valued. This was a gently paced session with a high degree of instrumental playing. The pupils worked through a set of carefully planned activities that enabled them to experience a sense of achievement, a rich and satisfying ensemble sound and consolidate their own skills. This was achieved through constant modelling of good technique and a musical dialogue that scaffolded the pupil’s ability to increasingly support their own learning and performance”

References:

- Saunders, J., Welch, G., Himonides, E., and Le Messurier, S. (2015, unpublished) Act Sing Play, A research evaluation of instrumental and vocal provision in Primary schools across England.
- Haywood, S., Griggs, J., Lloyd, C., Morris, S., Kiss, Z., and Skipp, A. (2015) Creative Futures: Act Sing Play Evaluation report and Executive summary, June 2015. Education Endowment Foundation & NatCen
- Barnett, S. M., and Ceci, S. J. (2002). When and where do we apply what we learn? A taxonomy for far transfer. *Psychological Bulletin*, 128 (4), 612-637. Butzlaff (2000)
- Cheek, J. M. and Smith, L. R. (1998). Music Training and Mathematics Achievement of Ninth Graders. Augusta State University.
- Cheek, J. M. and Smith, L. R. (1999). Music training and mathematics achievement of ninth graders. *Adolescence*, 34, 759-761.
- Gardiner, M. F., Fox, A., Knowles, F. and Jeffrey, D. (1996). Learning improved by arts training. *Nature*. Vol. 381(6580), May, 284.
- Gerry, D., Unrau, A., and Trainor, L. J. (2012). Active music classes in infancy enhance musical, communicative and social development. *Developmental Science*, 15 (3), 398-407.
- Hargreaves, D. J. and Aksentijevic, A. (2011). Music, IQ, and the executive function. *British Journal of Psychology*, 102, 306-308.
- Lamb, S. J., and Gregory, A. H. (1993). The relationship between music and reading in beginning readers. *Educational Psychology: An International Journal of Experimental Educational Psychology*, 13, 19-27.
- Patel, A. D., and Peretz, I. (1997). Is music autonomous from language? A neuropsychological appraisal. In I. Deliege, and J. Sloboda (Eds.), *Perception and Cognition of Music* (191-215). Hove (UK): Psychology Press.
- Patel, A.D. (2011). Language, music, and the brain: A resource-sharing framework. In: P. Rebuschat, M. Rohrmeier, J. Hawkins, and I. Cross (Eds.), *Language and Music as Cognitive Systems*. (pp. 289-311). Oxford: Oxford University Press.
- Saffran, J.R. (2003) Musical learning and language development. *Annual of the New York Academy of Sciences*, 999: 397-401
- Schellenberg, E. G. (2004). Music lessons enhance IQ. *Psychological Science*, 15, 511-514.
- Schellenberg, E. G. (2011). Examining the association between music lessons and intelligence. *British Journal of Psychology*, 102, 283-302.
- Schellenberg, E. G., and Mankarious, M. (2012). Music training and emotion comprehension in childhood. *Emotion*, 12, 887-891.
- Welch, G.F., Himonides, E., Papageorgi, I., Saunders, J.A., Rinta, T., Stewart, C., Preti, C., Lani, J., Vraka, M., and Hill, J. (2009). The National Singing Programme for primary schools in England: an initial baseline study. *Music Education Research*, 11 (1). 1-22.
- Welch, G.F., Himonides, E., Saunders, J.A., Papageorgi, I., Rinta, T., Preti, C., Stewart, C., Lani, J., and Hill, J. (2011). Researching the first year of the National Singing Programme in England: an initial impact evaluation. *Psychomusicology: Music Mind and Brain*. [Special Issue on the Psychology of Singing] 21 (1).
- Welch, G.F., Himonides, E., Saunders, J., Papageorgi, I. and Sarazin, M. (2014) Singing and social inclusion. *Frontiers in Psychology*, DOI: 10.3389/fpsyg.2014.00803