

# Effects of music education on musical, cognitive, social, and emotional skills of children from disadvantaged communities

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## INTRODUCTION

- ❖ Participation in formal music education has been associated with improvements in musical perception, cognition and performance, and with improvements on non-musical skills such as emotional sensitivity and social behaviour [1-2]. Nonetheless, research is scarce regarding children from disadvantaged communities.
- ❖ Engagement in structured music education has been found to enhance general and specific cognitive abilities, such as spatial and verbal abilities [3-4]. However, recent meta-analysis suggest that these effects are small, inconsistent, or nearly inexistent [5-6].
- ❖ In terms of socio-emotional development, findings are equally inconsistent. Some studies suggested positive effects of participation in group music activities on self-image and awareness of others, self-confidence, self-esteem, sense of belonging [7], social bonding and social behavior [8].
- ❖ Music lessons have also been shown to promote social cohesion within class, particularly in low ability, disaffected pupils [7]. Whereas some studies found music education to reduce aggressive behaviors [9] and promote pro-social behaviours [10], others found little to no social effects [11].

**Aim: To investigate potential effects of an active music education program on the development of musical skills (perception and performance), cognitive, social, and emotional skills of children from disadvantaged communities.**



## METHOD

### Participants

- ❖ 154 Portuguese children attending Year 2 in public primary schools without music or arts, in economically and socially deprived areas. Ten classes were randomly allocated to Music, Drama and Control.

	Music (n = 51)	Drama (n = 52)	Control (n = 51)
Number of girls	21	29	27
Age (in years)			
M (SD)	6.84 (0.42)	6.87 (0.44)	6.82 (0.43)

### Programs

- ❖ Programs were implemented in 60-minutes weekly sessions performed in classes by experienced specialist teachers throughout one school year.
- ❖ **Music program:** activities of listening to music from different cultures, performing – singing and playing together, imitation, musical games, improvising, composing, moving, and dancing [12].
- ❖ **Drama program:** performing activities, practice and rehearsal, memorization, learning pieces, role-playing, improvising, dramatic games, observing, movement and emotional expression [13].

### Measures | Domains of development

- ❖ **SES (socioeconomic status)** Family income, parental level of education.
- ❖ **Musical perception** Montreal Battery of Evaluation of Musical Abilities: melodic and rhythmic tasks [14].
- ❖ **Musical performance** Test designed for this study. Children had to learn and imitate a song and a rhythm.
- ❖ **Cognitive** WISC-III: tasks of Similarities, Picture Arrangement, Cubes, Vocabulary and Digits [15].
- ❖ **Social:** Social Skills Rating System [16].
- ❖ **Emotional:** Bar-On Emotional Quotient Inventory, Youth version, short (Bar-OnEQ-i:YV(S) [17].

## RESULTS

### Means (and standard deviations) for all measures at both testing sessions by intervention group

	Music		Drama		Control	
	Pretest	Posttest	Pretest	Posttest	Pretest	Posttest
<b>Musical perception</b>						
Melody	12.37 (3.04)	14.43 (2.52)	12.46 (3.43)	14.54 (2.78)	12.41 (2.84)	14.41 (2.47)
Rhythm	13.49 (3.04)	14.61 (3.28)	13.81 (3.36)	15.54 (2.83)	13.41 (3.21)	14.98 (3.06)
<b>Musical performance</b>						
Melody	2.30 (0.93)	2.25 (0.74)	2.33 (0.83)	1.99 (0.75)	2.18 (0.98)	1.77 (0.76)
Rhythm	2.24 (0.86)	3.06 (0.66)	2.41 (0.89)	3.00 (0.74)	1.93 (0.74)	3.25 (0.62)
<b>Cognitive domain</b>						
Similarities	10.71 (4.11)	11.75 (3.81)	9.63 (3.78)	10.90 (4.25)	10.33 (3.46)	11.53 (3.32)
Picture arrangement	9.75 (3.57)	11.31 (3.92)	10.98 (4.13)	11.71 (4.27)	11.04 (2.94)	11.55 (3.71)
Cubes	9.53 (3.09)	9.88 (3.46)	10.13 (3.16)	9.90 (3.55)	9.63 (2.58)	9.94 (2.68)
Vocabulary	9.41 (3.63)	9.27 (3.20)	8.79 (2.90)	8.69 (3.15)	9.80 (2.80)	8.55 (2.72)
Digits	8.25 (2.92)	8.73 (2.59)	8.15 (3.08)	8.40 (2.61)	7.75 (2.53)	8.41 (2.22)
<b>Social domain</b>						
Cooperation	23.24 (4.03)	23.02 (3.87)	22.27 (4.24)	23.38 (3.93)	25.27 (3.93)	24.92 (4.26)
Assertion	22.18 (4.18)	23.33 (4.68)	21.21 (3.60)	23.35 (3.98)	25.06 (4.01)	23.33 (4.09)
Self-control	23.25 (3.56)	24.24 (3.77)	21.83 (3.59)	23.73 (3.79)	24.67 (3.94)	23.29 (4.29)
Social Skills (composite)	68.67 (10.30)	70.59 (10.82)	65.31 (9.94)	70.46 (9.92)	75.00 (10.23)	71.55 (10.94)
Externalizing problems	10.20 (2.93)	9.88 (2.59)	10.29 (3.05)	9.85 (3.26)	10.53 (3.73)	11.08 (3.17)
Internalizing problems	8.69 (1.68)	8.25 (1.62)	8.79 (2.35)	7.98 (2.03)	10.04 (2.22)	10.98 (2.82)
Hyperactivity	9.00 (2.24)	8.55 (1.85)	10.00 (2.74)	9.13 (2.47)	9.37 (2.36)	9.19 (2.61)
Behavioral problems (composite)	27.88 (5.66)	26.69 (4.11)	29.08 (6.73)	26.96 (6.34)	29.94 (6.25)	31.24 (6.50)
Academic competence	17.94 (5.46)	18.55 (4.74)	18.04 (5.51)	18.81 (5.63)	18.61 (4.67)	20.29 (5.57)
<b>Emotional domain</b>						
Mood	3.28 (0.51)	3.35 (0.44)	3.38 (0.45)	3.55 (0.39)	3.42 (0.41)	3.19 (0.60)
Stress management	2.81 (0.56)	2.83 (0.58)	2.80 (0.64)	2.90 (0.62)	2.98 (0.60)	2.43 (0.59)
Interpersonal	2.91 (0.57)	3.01 (0.62)	3.05 (0.57)	3.12 (0.68)	3.01 (0.62)	3.07 (0.50)
Intrapersonal	2.36 (0.73)	2.43 (0.64)	2.58 (0.76)	2.57 (0.70)	2.53 (0.74)	2.26 (0.66)
Adaptability	2.89 (0.62)	2.82 (0.58)	2.91 (0.58)	3.06 (0.59)	3.02 (0.68)	2.65 (0.68)
Total score	2.91 (0.35)	2.95 (0.32)	3.00 (0.34)	3.10 (0.36)	3.05 (0.34)	2.78 (0.40)

### Musical and cognitive domains

- ❖ Concerning melodic performance, a regression hierarchical model (sociodemographic characteristics, cognitive skills, melodic perception and previous performance) accounted for 76% of the variance in melodic performance of a song, with only previous performance as significant predictor.
- ❖ Concerning rhythmic performance, a regression hierarchical model (sociodemographic characteristics, cognitive skills, rhythmic perception and previous performance) accounted for 45% of the variance, with only family income as significant predictor.

### Social domain

- ❖ Statistically significant differences in the cooperation, assertion and self-control skills in the pre-post, with significant interactions between time and experimental group.
  - ❖ Cooperation scores increased in the drama group and decreased in the music and control groups.
  - ❖ Assertion scores and self-control increased for the music and drama groups and decreased in the control group.

### Emotional domain

- ❖ Statistically significant differences in the Bar-OnEQ-i:YV(S) total scores in the pre-post, with a significant interaction between time, experimental group, and socioeconomic status group.
  - ❖ At the aggregate level, the music and drama groups increased their scores, whereas the control did not.
  - ❖ However, at the SES level, only the children coming from the lowest SES group exhibited a statistically significant development (music and drama).

## DISCUSSION

- ❖ These results provided preliminary evidence that the participation in music and drama education programs could be an important tool to booster children development in underprivileged communities.
- ❖ Our findings suggested that cognitive skills do not predict musical performance skills. Yet, we found that SES is a significant predictor of rhythmic, but not melodic performance.
- ❖ Our results also suggested that children who received the music and drama education programs showed an improvement on their assertion and self-control skills, and children in the drama group also improved their cooperation skills.
- ❖ Participants' involvement in music or drama also predicted a positive development of emotional skills amongst children from lower socio-economic groups.

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