EVALUATION OF THE CAUSAL IMPACT OF AN ORCHESTRAS' PROGRAM: CHALLENGES

Presented by

Patricio S. Dalton (Tilburg University)

How it all started: Motivation

- Empirical evidence that the **environment** an person **grows up** in during childhood has a **lasting impact** on his/her long-term **outcomes**

- Currie, 2001; Garces et al. 2002; Heckman, 2000; Heckman and Masterov, 2007 and Kling et al. 2007.

- External disadvantages of children who grow up in poor families may affect their:

  - cognitive development and learning,

  - non-cognitive skills (e.g. self-esteem), beliefs and aspirations,

- potentially creating a poverty trap.

- Theoretical Framework: Dalton, Ghosal and Mani (2015)

An existing policy to tackle this problem

- To expose disadvantaged children to music orchestra training at a young age.

- Implicit assumption: participating in a music orchestra mitigates many of the disadvantages of the environment → enhancing children's learning and cognitive and non cognitive skills → lifetime outcomes.

- Most importantly: orchestras are inclusive → break social discriminatory barriers inherent to poverty.

Qualitative and anecdotal evidence

Abreu's TED 2009 prize acceptance speech

" *The most miserable and tragic thing about poverty is not the lack of bread or roof, but the feeling of being no-one —— the feeling of not being anyone, the lack of identification, the lack of public esteem,"   He adds: "That's why the child's development in the orchestra and the choir provides him with a noble identity and makes him a role model for his family and community. It makes him a better student at school because it inspires in him a sense of responsibility, perseverance and punctuality that will greatly help him at school."..."   Once the child discovers he is important for his family, he begins to seek new ways of improving himself and hopes better for himself and his community.. …encourages them to embrace new dreams, new goals, and progress ..."*

Methodological challenge

- No rigorous study identifying
  - What is the actual impact? (causality and size)
  - What are the channels explaining the impact? (how)

- Selection bias: participation in music training is voluntary; hence some part of the observed long-term impact could be due to the innate characteristics of the program participants themselves (or their families), rather than the impact of the program.

- Does the program inculcate qualities like discipline, perseverance, self-confidence, punctuality? or is it that children who already possess these qualities are more likely to enrol in a music orchestra training?

Ideal methodological approach

- Randomized evaluation of the orchestra program.

- Random assignment ensures that, on average, the pre-program characteristics of children who undergo the music training are the same as those of children who don't.

- Hence, we can be confident that any observed differences in the outcomes of included versus excluded children can be attributed to the effects of the music training itself.

Back in 2008, we took the challenge

- Our aim was to examine and quantify the causal impact of orchestra training on both cognitive and non-cognitive skills of poor children not just in the short run, but also the medium and long run.

- Team:
  - Patricio Dalton (University of Tilburg)
  - Sajantan Ghosal (University of Glasgow)
  - Anandi Mani (University of Warwick)
  - Fabian Waldinger (University of Warwick)

Political agreement and funding

- March 2008: Starts conversations with the Director of the National Program of Children and Young People's Choruses and Orchestras for the Bicentenary. CAGE Funding

- April 2011: Agreement with the Office of Socio-educational Policies, Argentine Ministry of Education.

- May-August 2011: School selections, hiring teachers and staff, buying instruments, hiring survey company, developing and testing baseline surveys, implementing baseline, randomization.

- 2011 September: Orchestras started

- 2011 October: Argentine Presidential Elections

Did not have much time for piloting!

RCT Design: Selection of Municipalities and schools

1. Visit the poorest municipalities of Gran Buenos Aires.

2. Talk with the Majors of each municipality about the program and the randomization.

3. Ask them to give us a list of 4 to 6 schools that fulfilled the eligibility criteria (very low socioeconomic conditions, a hall to play, some rooms available and a safe place to store the instruments).

4. Visit the schools to check that the criteria were met and directors were willing to help

5. Randomly assign half of the schools per Municipality to the orchestras' program

Barriers to randomization

1. **Political** barriers: politicians have strong **preferences** for some schools and neighbourhoods than others.

   Our response: Randomization was the only way to implement the program with National Government funding (needs strong political support from above)

2. **Parents discontent** of being "arbitrarily" excluded from the program

   Our response: In a couple of years "control" schools will be also treated.
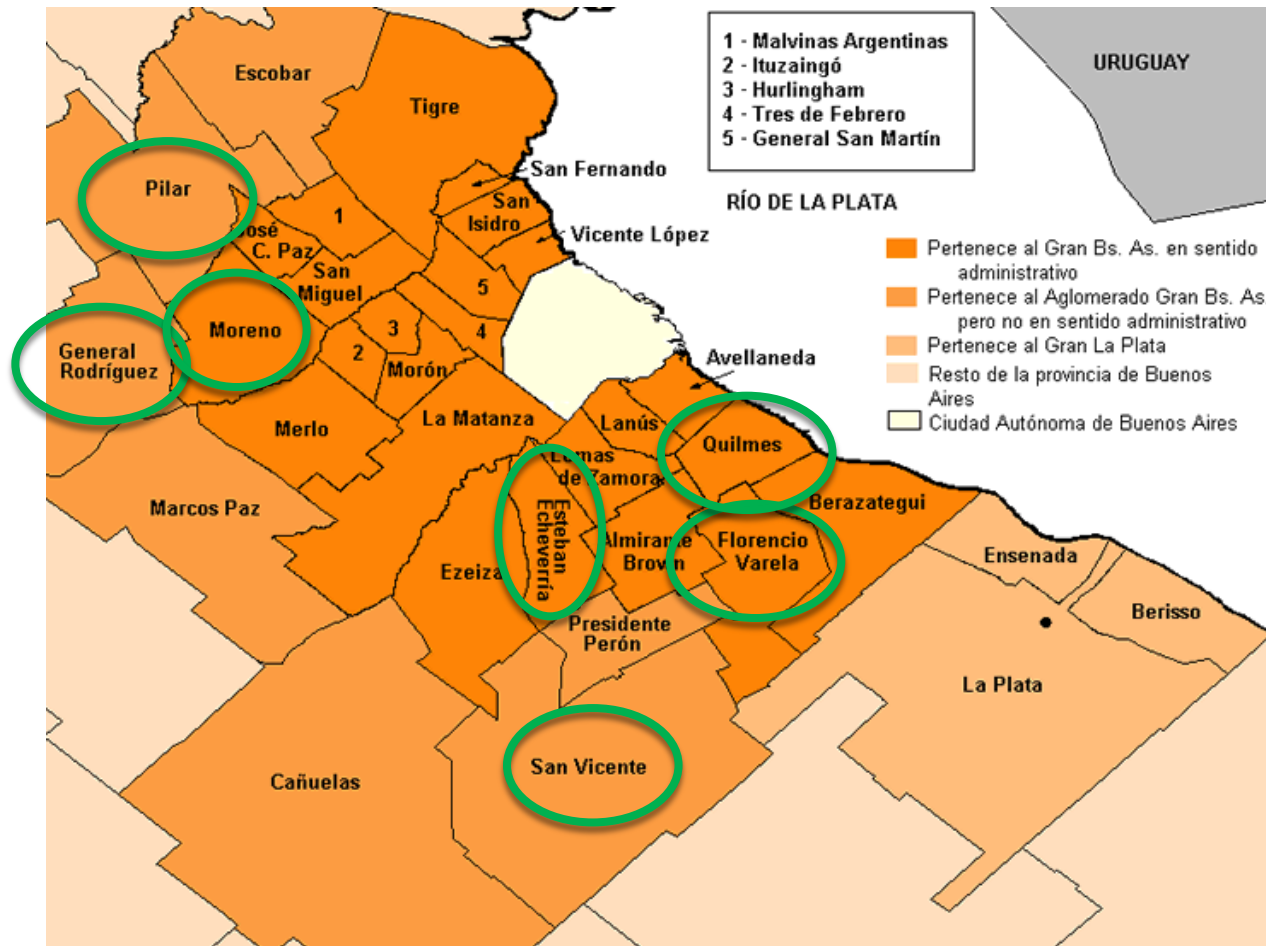
3. **School directors** don't like external evaluations.

   Our responses:

   We are not from the WB or IMF. We are part of your in-group.

   Data can be used by the school

   No help, No possibility of orchestra

Municipalities involved

Note: Lujan is not in the map

RCT Design:
Information meetings

- <u>Open a call</u> in the schools listed by the Mayors for parents interested in the program

- <u>Information session</u> to inform parents about the program and about the randomization.
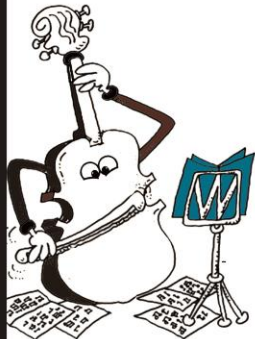
In the meetings
Baseline Parental survey

- <u>Aim</u>: to track to those who expressed an interest in enrolment - irrespective of whether an orchestra was set up in their child's school or not.
- **General information about the parents and family**
  - *Socio-economic conditions*
  - *Beliefs (e.g. effort pays)*
  - *Investments in their children (time and money)*
  - *Parental educational aspirations (wishes) and expectations (beliefs) for their children*
  - *Parental job aspirations for their children*
- **General information about the child**
  - *Does he/she play an instrument?*
  - *Time spent in different activities during the day*
  - *Parents' assessments of the child's preferences, attitudes, beliefs and behaviour.*

At school:
Cognitive skills of children

Cognitive skills

- Maths

  - An expert designed ad-hoc math test for 3rd, 4th, 5th and 6th grade (8, 9, 10 and 11 years-old)

  - Each test had 8 questions with up to 3 sub-questions

  - Clear criteria to evaluate each of the questions

  - The math tests were tested and piloted in two schools

At school:
Non-cognitive skills of children

Non-cognitive skills

- Multidimensional Children's **Locus of Control** Scale (Richaud, 1991) (created for children from 6 to 12 years old in Argentina) (32 items)

- Harter **Self-worth** scale (36 items)
  - **Scholastic Competence:** child's perception of his/her competence
  - **Social Acceptance:** the degree to which the child feels accepted by their peers
  - **Behavioral Conduct:** the degree to which the child likes the way he/she behave
  - **Global Self-worth:** the extent to which the child likes him/herself as a son, a friend, and is generally happy the way he/she is

Randomization of schools to orchestras

- <u>Randomization</u> within Municipality (half of the schools in a locality would receive an orchestra (the treatment group) and the other half would not get an orchestra (the control group).

- <u>18 Orchestras started</u>

Children in Treatment and Control Schools

Municipality	No. of students interviewed per school						
1- Varela	106	406	77	110	251	219	1169
2- Rodríguez	93	90	172	91			446
3- Luján	36	54	85	62	153		390
4- Moreno	313	107	0	251	104	217	992
5 Pilar	273	125	226	33			657
6 Quilmes	103	116	151	133	73	143	719
7 S. Vicente	203	191	46	89			529
8 E. Echeverría	104	248	140	106			598
Total							**5500**

Green: 18 Treatment Schools: 2618 students
Yellow: 18 Control Schools: 2259 students
Purple: 3 Schools with randomization problems

Parents in Treatment and Control Schools

Municipality	No. of parents interviewed per school						
1- Varela	26	19	7	23	22	32	129
2- Rodríguez	5	23	15	8			51
3- Luján	0	7	0	0			7
4- Moreno	26	8	0	0	11	16	61
5 Pilar	37	19	38	4			98
6 Quilmes	3	10	32	15	12	20	92
7 S. Vicente	11	28	8	30			77
8 E. Echeverría	26	34	20	9			89
Total							**604**

Green: Parents in treatment schools: 312
Yellow: Parents in control schools: 237
Purple: Randomization problems: 54

Results from the math test

- The test was difficult for the students.

- Average mark:19.80 out of 110 (maximum score)

- More than 10 percent of the students could not answer any questions correctly

- The best 25 percent received a mark of 30, the best 10 percent a mark of 45, and the best 5 percent a mark of 55

- Results different from pilots in other slums in the city of Buenos Aires
  - No collaboration from students and/or
  - Worst conditions in the slums of the suburbs than in the slums of the city of Buenos Aires

Selection into the project

□ Did children who were interested in joining the orchestras have better math skills than those who were not interested?

□ Yes..

	(1)	(2)	(3)	(4)
Difference between interested and not interested	2.818*** (0.909)	2.826*** (0.910)	2.902*** (0.901)	2.884*** (0.897)
Male Student		Yes	Yes	Yes
School grade (3rd to 5th)			Yes	Yes
School Fixed Effects				Yes
Observations	4,005	4,002	4,002	4,002
R-squared	0.002	0.002	0.024	0.095

Characteristics of families who wanted their children to attend the orchestras

	All	Control Group	Treatment Group	Differences Con-Treat	t-test
Child's characteristics					
Child Male	0.49	0.46	0.52	-0.06	-1.38
Child school grade	4.03	4.05	4.03	0.02	0.28
Baseline math some correct answers	0.84	0.82	0.86	-0.04	-1.03
Baseline math total score	22.21	19.66	24.43	-4.77	-2.36
Parental characteristics					
Parents Foreign	0.18	0.24	0.14	0.1	2.87
Parents Married	0.35	0.31	0.38	-0.07	-1.78
Mother's years of education	8.14	8.01	8.23	-0.22	-0.77
Father's years of education	7.97	7.87	8.04	-0.17	-0.57
Mother employed	0.39	0.39	0.38	0.01	0.28
Father employed	0.88	0.87	0.88	-0.01	-0.22
Number of books at Home	30.83	30.95	30.74	0.22	0.05
Parental aspiration of child's edu.	15.36	15.4	15.32	0.08	0.58
Parental prediction of child's edu.	14.54	14.59	14.51	0.08	0.47
Hours parents spend with child doing:					
Homework	5.03	5.04	5.03	0.01	0.03
Reading	3.31	3.24	3.37	-0.13	-0.41
Number of siblings	2.02	2.11	1.95	0.16	0.99
Observations	549	237	312		

Challenges in the implementation

Mainly due to the extremely vulnerable and delicate conditions of the locations where the orchestras' project is implemented.

- *Parental surveys*
  - *High analphabetism* → *Needed more assistants/sessions or monetary incentives*
- *Children Math and psychological tests*
  - Indiscipline: the assistants were even physically and verbally threatened by the children
  - Low level of education of the children, below what it is expected for a child of equivalent age and socio-economic status in other parts of the country
  - Low collaboration from teachers and directors (varied across schools)
- *Survey firm*
  - Lack of professionalism: The questionnaires from information meetings in a number of schools were lost.
- *Matching problems: self-selection*
  - few children of parents who attended the initial information meeting actually play in the orchestras

Final matching per treated school

Locality	Students whose parents attended information meeting		Students taking math test	
	All	In orchestra	All	In orchestra
F. Varela	19	6	406	31
Luján	0	0	36	1
Luján	0	0	85	12
Moreno	26	2	313	11
Moreno	11	1	104	13
Moreno	16	5	217	20
Quilmes	3	0	103	4
Quilmes	32	7	151	14
Quilmes	15	2	133	8
S. Vicente	8	3	46	4
S. Vicente	30	7	89	8
E. Echeverría	26	2	104	9
E. Echeverría	20	4	140	13
Average	**15.84**	**3**	**148.23**	**11.38**

Conclusion

- The goal of our research project was to examine the impact of music orchestra training on the cognitive and non-cognitive abilities of poor and socially disadvantaged children.
- Half of a set of 38 schools in the city's poorest municipalities were assigned to an orchestra-based training program.
- Able to successfully design and implement the program in the short run
- Sample size got significantly reduced for different reasons
- We lost statistical power to do any rigorous analysis of the impact in the future.

Lessons still learned from the data collected

- Selection into the orchestras:
  - Parents who express an active interest in their children's participation in the training program devote time and effort to their children's development and have high aspirations for them.
  - Children who were interested in joining the orchestras have better math skills than those who were not interested
  - Presence at the initial parents' meeting is not a very good predictor of who actually enrols in the orchestra eventually.
  - It may be useful to use monetary incentives to elicit actual intention to participate? rather than merely a casual interest…
  - To be continued…

Thank you!