Can arts-based interventions enhance labor market outcomes among youth? Evidence from a randomized trial in Rio de Janeiro[#]

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Abstract

This paper provides findings of a small-scale, innovative labor training program that uses expressive arts and theatre as a pedagogical tool. The corresponding life skills training component is combined with a technical component teaching vocational skills. To our knowledge, this is the first paper to rigorously evaluate the effectiveness of a training program constructed around expressive arts. Using a randomized assignment of *favela* youth into program and control groups, we look at the short-run treatment effects on a comprehensive set of outcomes including employment and earnings as well as measures of personality traits and risk behavior. We find positive short-run employment and earnings impacts five months after the program finalized; no impacts are found for shorter periods. These short-run impacts are economically very large, compared to those typically found in the literature: a 33.3 per cent increase in the probability of being employed, and a 23.6 per cent increase in earnings. We find no evidence of significant program impacts on other outcomes, including personality-related traits, providing evidence that these traits may not be malleable for young adults in the short-run. We argue that the estimated labor market impacts are due to a combination of both skills formation and signaling of higher quality workers to employers.

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1 INTRODUCTION

Brazil has seen remarkable progress in labor market outcomes over the last decade. Due to years of favorable growth, the country experienced a broad-based increase in wages, falling unemployment, increased formality and improved job quality, and a generally more efficient labor market. In addition, this job creation and wage growth has been particularly equitable, and therefore the main contributor to decreases in income inequality (Barros et al., 2007; Hoffman, 2009).

This progress notwithstanding, labor market outcomes of youth—particularly those from disadvantaged socio-economic contexts—continue to be markedly worse than almost any other demographic group. These youth face lower wages, higher levels of informality and more frequent unemployment spells. Their attachment to the labor market is also tenuous and punctuated, characterized by a higher frequency of dismissals than is found for adults.

Labor economists identify several possible culprits for the poor performance of disadvantage youth, including low quality schooling (Quintini et al., 2007) and poor family and neighborhood environments, which result in accumulated deficits in different types of human capital. These limited starting conditions also result in deficits in acquired skills, both cognitive and non-cognitive (also referred to as socio-emotional, socio-affective or life skills). As a result, these disadvantaged youth face significant headwinds entering and being successful in the formal labor market. This problem is typically addressed through a wide array of policies and programs, with focuses ranging from flexible youth contracts, wage subsidies, public employment schemes, remedial education programs, vocational and technical training, to programs focusing on the development of different types of soft skills.

This paper discusses one of the more innovative approaches at dealing with unemployment among disadvantaged, *favela* youth in Rio de Janeiro (Brazil), pioneered by a small NGO, *Galpão Aplauso*. The novel dimension of this program is the use of expressive arts and theatre as a pedagogical and skills building tool. This tool is used in tandem with other more orthodox vocational and academic components. Although expressive arts have long been used as a vehicle for teaching—including for at-risk youth—their use in a labor training program is uncommon.

This paper contributes to the labor training literature in two important ways. First, it is the first (to our knowledge) rigorous evidence on the effectiveness of an arts and theatre-based

pedagogical instrument aiming at impacting employment and earnings. Second, the paper also contributes to the literature on the role of both cognitive and socio-emotional skills in labor market outcomes. Our understanding of how these skills are jointly determined and how they impact labor market outcomes remains quite limited, despite recent advances in research in this area (Almlund et al., 2011; Heckman and Kautz, 2012) – the findings of our analysis provide novel additional evidence in this regard.

The paper is organized as follows. Section 2 discusses the evidence on the effectiveness of different modalities of youth training in general. It also delineates how cognitive and non-cognitive skills are measured, along with the relationship between socio-emotional skills, personality traits, and labor market outcomes. Finally, we review the evidence on the connection between expressive arts and cognitive development. Section 3 presents the *Galpão Aplauso* program in the context of the labor market for disadvantaged youth in Brazil and Rio de Janeiro, and the constraints that limit their employment and earnings outcomes. Moreover, section 3 discusses the design and implementation of the experiment. In section 4 we present descriptive analyses of the data and the impact estimates on a series of outcomes: labor market results, social activities and risky behavior, and life skills. Section 5 discusses our findings and concludes.

2   THE EVIDENCE ON YOUTH TRAINING, COGNITIVE AND NON-COGNITIVE SKILLS IN THE LABOR MARKET, AND EXPRESSIVE ARTS

2.1   Youth training programs

Youth (un-)employment is one of the most persistent problems in public policy. Although employment is almost universally one of the most important social and economic concerns of policy-makers, the different nature of youth employment often calls for policies that are different than those targeted at adults. Youth tend to have lower labor market attachment, and higher levels of job turnover. For example, administrative data on labor markets in Brazil show that the frequency of youth dismissals is much higher than those for adults (Corseuil et al., 2013a), a stylized fact also observed in many other Latin American countries (Cunningham and Salvagno, 2011). Youth employment is particularly cyclical (Verick, 2011; Choudhry et al., 2012), and since youth have had little time to accumulate assets, they are more vulnerable to the immediate consequences of unemployment spells. The impacts of negative labor market experiences (e.g.

unemployment spells) are particularly persistent in the case of low-educated youth (Burgess et al., 2003). Research also suggests that both the duration and the frequency of these spells may be higher for youth with lower levels of schooling and other economic disadvantages (Quintini et al., 2007).

In addition, low-skilled workers are less capable of obtaining jobs through more formal mechanisms, and therefore rely to a greater degree on informal networks (Wahba and Zenou, 2005). As the quality, size and density of networks are important for obtaining jobs through informal connections, youth may be at a disadvantage, given they have not had time to acquire high-quality peer networks, having to rely to a larger degree on parental ties (Kramarz and Skans, 2011). This pattern may be more pronounced in the case of youth who lack credentials entirely (high school drop-outs), or who have poor credentials (poor academic performance).

Youth from marginal communities also face disadvantages due to poorly developed cognitive and socio-emotional skills. Cognitive skills – such as academic knowledge, literacy, mathematical ability – as well as other traits related to intellect and intelligence are usually considered to be important in determining labor market outcomes. Recent empirical evidence brings to light the importance of socio-emotional skills by shaping education and labor market decisions, and by determining success, conditional on having made certain choices. Cognitive and socio-emotional skills are also intrinsically linked, as they are jointly determined—with socio-emotional skills determining cognitive skills and vice-versa (see section 2.2 below and Almlund et al., 2011, for an extensive literature review).

The available set of policies and programs that are typically used to address youth employment and earnings is extensive. They are typically in the form of Active Labor Market Policies (ALMPs). ALMPs range from demand incentives in the form of targeted wage subsidies (either directly or through tax incentives), direct public employment, flexible employment modalities that reduce transaction costs and avoid contingent labor liabilities (including internships), and sponsored intermediation services to various types of training and vocational programs. For the most part, these programs are implemented, managed or financed with public funds. However, non-public actors collaborate with publicly-sponsored programs and provide an opportunity to experiment and implement novel solutions on a small scale.

Recent quantitative reviews of ALMPs in industrialized countries find that they are limited in their ability to actually enhance employment, even if they tend to have modest impacts on

earnings. For instance, Card et al. (2010) look at 199 studies on ALMPs from 1995 to 2007. They find generally small point estimates of program effectiveness on employment and earnings, with public employment faring the worst and classroom and on-the-job training doing the best. Youth programs yield smaller and less positive results, according to the authors. In a similar meta-analysis, Kluve (2010) synthesizes 137 different program evaluations from 19 industrialized countries and finds limited evidence for the effectiveness of most ALMPs. The study identifies that effectiveness is driven much more by type of program than by contextual factors, with some programs such as direct employment producing negative employment effects, while wage subsidies produce relatively large impacts on employment.

Although ALMPs generally have small or negative short-run impacts, these tend to increase over time (Card et al., 2010). In the case of a review of the US-based Workforce Investment Act (Heinrich et al., 2013), the authors find that beneficiaries actually see lower employment and earnings in the short-run, followed by modest gains, mostly in the form of higher earnings. Using administrative data from German programs, Caliendo et al. (2011) find the same pattern, in which initial results are negative, followed by an increase in employment and earnings over time. In that particular study, training programs tend to have initial negative impacts for about 10 months, followed by an increasing impact over time. Wage subsidies, on the other hand, do not produce negative impacts, but their impact peaks at 12 months and fades away after that peak.

Evidence for the effectiveness of ALMPs for emerging economies – and Brazil in particular – is much less common. Urzua and Puentes (2010) report on the findings from Latin America and the Caribbean (LAC) and find that the evidence is generally more positive than in the industrialized context, with consistent findings of positive (if modest) employment effects, particularly for women. However, the authors are quick to point out the relatively poor evidentiary basis of these studies.

Urzua and Puentes' caveats regarding the evidence are well placed. There are surprisingly few rigorous evaluations of ALMPs in LAC, and even fewer in Brazil. In addition, the impacts documented in more rigorous program reviews tend to to be small. Card et al. (2011) provide the first rigorous evidence of the effectiveness of a youth training program, for the Dominican Republic's *Juventud y Empleo (JE)*, a labor training program consisting of vocational and basic or life skills training with a subsequent program-sponsored internship. The authors find no impact on employment, although they do find impacts on both wages (10 per cent treatment

effect) and formality. Subsequent studies find similar results. Ibarraran et al. (2012) look at the second phase of the JE program and essentially find identical results: quality of employment and (to some degree) earnings increase, but there are no employment impacts. Attanasio et al. (2011) look at the case of Colombia's *Jovenes en Acción*, a program structured very much like *JE*: a combination of training and internship. As was the case with JE, the authors find no employment impacts in general (except for women), although they do find impacts on both earnings and formality, again only for women (19 per cent treatment effect on wages). Alzua et al. (2013) look at a small-scale, NGO-run training program in Argentina, and again find no employment effects, but some effects on labor earnings.

In the case of Brazil, there are two main studies that rigorously review the effectiveness of ALMPs: Oliveira and Rios-Neto (2007) and Corseuil et al. (2013b). Oliveira and Rios-Neto evaluate the impact of a vocational training program conducted in Minas Gerais on employment, and on the duration of employment. They find both employment effects and a stronger attachment to the labor market. Corseuil et al. (2013b) use longitudinal administrative data on wages, hiring and unemployment spells to evaluate the effectiveness of the Brazilian *Jovem Aprendiz* program, a flexible employment modality. By looking at changes in the program's eligibility rules, they are able to estimate impacts on employment and wages, and find significant impacts on wages (roughly 50 percentage point increase) two years after the first participation in the program.

2.2   The role of cognitive and non-cognitive skills in the labor market

Economics has long been interested in the role of cognitive skills on labor market performance, but until recently the profession has dismissed socio-emotional skills as unimportant for job performance. In the United States, the discussion of the role of cognitive skills was important in the context of estimating returns to schooling. Blackburn and Neumark (1993) and Cameron and Heckman (1993) both find evidence that test scores (as proxies of cognitive ability) play a role in determining earnings, and that without them estimates of the returns to education might be overstated. These findings were corroborated by several other early studies, although the relevance of cognitive skills was by no means unanimous. For example, Murnane et al. (1995) find that they are not important conditional on schooling levels, particularly for women.

Evidence outside the United States has also shown a positive relationship between cognitive skills and earnings. For Canada, Green and Riddell (2003) find a significant effect of literacy test scores on earnings, even when experience, education and family characteristics are accounted for. Anger and Heineck (2010) find that wages in Germany are positively related to speed of cognition, although word fluency does not seem to matter. In one of the very few studies that look at the role of cognitive skills in LAC, Diaz et al. (2012) find that verbal fluency, math problem solving and memory are all strongly related to earnings in Peru. Measures of intelligence are usually less important in determining career success or earnings for most occupations. The Peru study shows that although all cognitive measures are strongly related to earnings, once schooling levels are accounted for in the regression, only math problem solving is significant at conventional levels (ibid.). A previous study by Bassi and Galiani (2009) essentially finds the same result: cognitive ability—in this case measured by the Ravens' test—impacts earnings only through education.

Social sciences have been studying the role of emotional skills in shaping social outcomes for many years. Psychologists and Sociologists have long since studied the role of socio-emotional traits on subjective well-being (SWB), measures of health, quality of life and longevity; the success and enjoyment of family, peer and intimate relationships, occupational choice and labor outcomes, among many other outcomes. Ozer and Benet-Martínez (2006) review main papers in the Psychology and Sociology literature, and find strong correlations between psychological traits and consequential outcomes. In most cases, the studies utilize measures of personality traits—usually measured by self-reported psychological tests.

The most common framework of personality traits used in the literature is the Five Factor Model or Big Five Factors (Costa and McCrae, 1988), in which all relevant personality traits are subsumed into five main traits—each with a series of sub-traits. The "Big Five" traits are (i) Conscientiousness, (ii) Openness to Experience, (iii) Extraversion, (iv) Agreeableness, and (v) Neuroticism/Emotional stability.[1] This framework has become the conceptual workhorse of research on personality psychology. Over the years, variants of the framework and, equally significant, innumerous instruments with which to measure each of the core and subordinate

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[1] These dimensions and their subordinate sub-traits can be measured by self-reported psychological tests, direct inquiry by a professional psychologist, or by reporting by a lay third party, also through a structured questionnaire. In practice, they are typically estimated based on self-administered personality tests.

personality traits have emerged. However, most research into personality traits treated the traits themselves as largely exogenous and fixed over the lifecycle. Although this view has been (successfully) challenged by recent research, in practice there are few studies that attempt to model how these traits can themselves be impacted by public policies.[2]

Modern approaches look at skill formation from a unified perspective, in which cognitive endowments impact decision-making throughout the lifecycle, which in turn also impact both measures of cognitive and socio-emotional development. Heckman et al. (2006) provide one of the first attempts to model socio-emotional skills as an endowment. They show how the different distribution of trait endowments (both intelligence and socio-emotional endowments) can lead to different decisions, including differences in sorting into jobs, and different schooling decisions. Cunha and Heckman (2008, 2010) expand this model to take into account dynamic investment over the life-cycle. In effect, socio-emotional skills are not treated as stationary at a point in time, but rather shaped by different decisions by households and individuals.

Evidence also points to the importance of both cognitive and socio-emotional skills in shaping labor market outcomes. Bowles et al. (2001) provide a review on early empirical evidence and conclude that both socio-emotional skills and cognitive skills explain a significant portion of variation in earnings. Osborne (2005) applies a Rotter scale of locus of control and finds that both locus of control and aggression (both aspects related to Neuroticism/Emotional Stability in the Big Five) are associated with higher wages of both men and women. They also find that these measures explain a larger share of variance in (log) wages than do measures of crystalized (such as IQ) or fluid intelligence. This is a similar finding to that of Heckman et al. (2006) and Mueller and Plug (2006). Using data from the Wisconsin Longitudinal Study (WLS), Mueller and Plug (2006) find that some aspects of the Big Five are related to earnings, but that the effects are different between men and women.[3] They also find that, in some instances, "positive" psychological traits either are not related to earnings or actually are associated with lower earnings; agreeableness seems to be related with *lower* earnings for men.

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[2] Costa and McCrae (1988) argue that most personality traits are immutable after adolescence; a view that has since been systematically falsified by numerous studies. As such, psychologists did not advance a framework by which the formation of socio-emotional skills over time would be modeled based on an accumulation of life experiences.

[3] High levels of conscientiousness seem to be related to higher wages for women, whereas openness (which is also related to IQ) seems to be related to higher wages for men.

More recently, Heineck and Anger (2010), using the German Socio-Economic Panel Study (GSOEP), corroborate some of the findings above. They find that locus of control is important for earnings of both men and women, and the effect is twice as large as the measures of cognitive ability in the GSOEP. On the other hand, Heckman et al. (2011) find that personality traits play a relatively unimportant role in determining labor outcomes (or health outcomes), except for their role in shaping education decisions. Finally, a recent review of the evidence by Almlund et al. (2011) suggests that *conscientiousness* and *internal locus of control* (related to Neuroticism/Emotional Stability) seem to be particularly predictive of worker turnover (Gallo et al, 2003), sorting into professions (Barrick and Mount, 1991; Ham et al., 2009; Heckman et al., 2006), and earnings (Cattan, 2011).

For LAC there are two main studies that look at the importance of cognitive and socio-emotional skills: Diaz et al. (2012) and Bassi and Galiani (2009). Both studies find that socio-emotional skills are less important than cognitive skills, but cognitive skills are largely mediated through education. That is, cognitive skills impact earnings through higher educational attainment. However, both of these studies relied on large national surveys, and were not necessarily targeted to the youth population that is usually the subject of ALMPs. Ibarraran et al. (2012) collect experimental data from latter rounds of the Dominican Republic youth training program (*JE*, see section 2.1), and measure both cognitive and socio-emotional skills. Although they find evidence that the program impacts the formation of non-cognitive skills[4], curiously they find that these skills were unimportant in determining labor market outcomes.

2.3 Expressive arts and cognitive development

The importance of arts and music in the development of the brain and its consequences for intellectual and socio-emotional development is increasingly well documented in the medical and social sciences literature. Music training in particular has been found to be important for cognitive development. For example, looking at school-age children, Schellenbert (2011) finds that music appears to impact several dimensions of cognitive function. There is less evidence regarding the role of expressive arts in cognitive and emotional development.

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[4] The authors use three different scales to measure non-cognitive skills: The Social and Personal Competencies Scale (CPS), The Rosenberg self-esteem scale, and the Grit Scale.

Developmental psychologists argue that arts-based therapies can help school-age youth exercise emotional regulation (Moneta and Rousseau, 2008). In a compendium of studies looking at arts and cognition (Ashbury and Rich, 2008), Posner et al. (2008) suggest specific pathways through which arts can impact the brain: They argue that networks in the brain related to both "executive attention" and "effortful control" can be impacted by arts. Since these networks are associated with different types of cognitive functioning—including emotional—this strengthening can potentially impact a wide range of cognitive processes.

The evidence linking specific types of expressive arts-based activities with improved cognitive processes among youth is scarce. Most studies that look at this connection are concentrated in the medical literature, and generally focus on programs associated with the elderly, as e.g. in complementary treatments for cancer, or in post-operative settings (Stuckey and Nobel, 2010). In one of the few randomized trials to test the cognitive and socio-emotional impacts of expressive arts on youth, Schellenberg (2004) finds that expressive arts have a large impact on socio-emotional outcomes (as measured by psychological tests), but no impacts on measures of crystalized intelligence (as measured by an IQ test). Music lessons, on the other hand, have a small impact on crystalized intelligence and no impact on socio-emotional metrics. This result is similar to that found in less rigorous studies (reflexive evaluations). For instance, in a pre-post comparison, Wright (2006) finds improved role-taking ability, as well as verbal ability following participation in a theatre program. In a randomized trial analyzing an expressive arts program in Finland, Joronen et al. (2011) find that participation in drama reduced the instances of bullying in school.

3   THE *GALPÃO APLAUSO* PROGRAM IN RIO DE JANEIRO

3.1   Labor market conditions for youth in Rio de Janeiro

The *Galpão* program was implemented against the background of a generally positive labor market context. The city of Rio de Janeiro has experienced overall positive employment and earnings growth over the past decade. For example, data from the *Pesquisa Mensal do Emprego*[5]

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[5] The PME is the main instrument for recording high-frequency data on labor markets – including informality - over time in Brazil. It is a monthly household survey conducted by the Instituto Brasileiro de Geografia e Estatística (IBGE) in the six larger metropolitan regions of Brazil.

allow us to analyze the labor market trends during the time period of our analysis of the *Galpão Aplauso* Program.

According to the PME, Rio de Janeiro has seen a remarkable improvement in terms of employment, earnings, and formality. Table 1 reports the evolution of labor market indicators regarding employment opportunities according to different segments. Unemployment rates are shown in the first four columns, while the employment shares in manufacturing and construction are shown in the next four columns. In each row we show averages for the first six months of the respective year. The numbers in the first row illustrate the labor market situation prior to the training sessions. The last two rows show the labor market evolution at the time of random assignment and collection of the baseline data (first half of 2012), and some months after the training when the follow-up was conducted (first half of 2013).

< Table 1 about here >

Unemployment rates have been decreasing both in Rio and in other metropolitan regions. The trend is the same once we restrict the sample for youth. Irrespective of the geographical areas, the decline is more intense in the most recent period. As most individuals trained at *Galpão* are placed in activities related to manufacturing and construction, we also illustrate the share of these sectors in employment for the same segments. The table shows a decline of around half a percentage point (p.p.) for the employment share for these sectors both in Rio de Janeiro and in other metropolitan regions from 2010 to 2013. The picture changes when we restrict the analysis to youths: their employment share in manufacturing and construction rises in Rio de Janeiro and declines by 0.5 p.p. in other regions.

Table 2 presents data on the evolution of labor market indicators regarding job quality for the same demographic categories. Informality rates are shown in the first four columns, while average labor earnings are shown in the next four columns. We can see that, up to 2012, informality rates have decreased at a lower rate in Rio de Janeiro than in other metropolitan regions. In contrast, from 2012 to 2013 informality decreased more sharply in Rio than in other regions. The pattern registered for the sample restricted to youth is similar to the one for all individuals, as attested by comparing columns three and four with columns one and two, respectively. The remaining columns of the table report the evolution of a normalized index for

labor earnings. One can see that labor earnings for youth increase more in Rio de Janeiro than in other regions from 2012 to 2013, despite the reverse trend from 2010 to 2012.

< Table 2 about here >

Overall we can see that in recent years the labor market has been improving in all dimensions analyzed with respect to employment opportunities and job quality. It is important to note that the best situation for young individuals in Rio de Janeiro is always identified for the time between the first half of 2012 and the first half of 2013; this coincides with the training period for the *favela* youths trained at *Galpão*. As we shall see later on, the overall employment trends on youth from the PME in Rio de Janeiro are very similar to the profiles we observe in the program beneficiary data.

3.2 The *Galpão* Program

In 2009, the Inter-American Bank's Multilateral Investment Fund (MIF) partnered with the *Instituto Stimulu Brasil* to finance the "Sociocultural and Productive Integration of At-risk Youth" project in Rio de Janeiro (henceforth referred to as *Galpão Aplauso*, or just *Galpão*). The project aims at improving the socio-economic situation and employability of youth by teaching basic skills, life skills and vocational skills, and providing placement services. The program thus consists of a combination of vocational, academic and life skills training, delivered through a pedagogic method that utilizes arts and dance.

The initiative grew out of the perception that cultural spaces built in the *favelas* merely served to consolidate ghettos. Young people could not move from one community to another because of the violence and their limited ability to move about the city. The idea was to create a neutral downtown space, specifically in the port area, away from the *favelas*. The working methodology created and used by *Galpão Aplauso* aims to help young people escape from social

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program beneficiary status and become citizens embraced by the labor market. The program had been in operation since 2005, but has undergone significant changes from 2009 to 2013.[6]

The program is particularly intensive, if compared with other youth training programs in the region (e.g. *Juventud y Empleo, Jovenes en Acción*). Program duration is approximately 6 months, 5 hours a day, 5 days a week, delivered in three shifts—morning, afternoon, and evening. The treatment includes 300 hours of vocational training (mainly construction-related, soldering, wood shop), 180 hours of training on academic and basic skills, including remedial courses in both Mathematics and Portuguese, and 120 hours in life skills. The vocational component is tailor-made to the beneficiaries: Program administrators identify students with different types of aptitude and intend to assign them to the most appropriate type of vocational activity. Within the life skills component, youths attend sessions on basic principles of "social harmony", which emphasize civics and certain shared values, along with socio-emotional development. For instance, concepts, principles and values such as ethics, civic responsibility, respect, environmental education, solidarity, health and honesty are taught. The pedagogic model employed makes extensive use of arts and theatre as training mechanisms.

Unlike other programs evaluated in LAC, *Galpão's* job placement strategy was loosely structured around formal and informal agreements with local private sector firms. It also did not have a formal internship program. In some cases, *in situ* vocational training is sponsored by partner firms. In other instances, firms make contributions (regular or ad hoc) to the program but would not specifically sponsor any type of training. According to interviews with the program administrators, demand for the program is produced by word-of-mouth, relying mainly on former participants, teachers, and private sector partners to announce the opening of each of the cohorts. Given that the cohorts are over-subscribed, the program does not need to carry out information or dissemination campaigns. Based on administrative data, the average cost per youth is R$ 810 (USD 385) a month, or R$ 4,680 (USD 2,225) for the entire curriculum.

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[6] The program was originally co-financed by the public sector. Its first partnership was with the Municipality of Rio de Janeiro, from which it received public funding to train *favela* youth. During its early years, the program was very large, reaching a peak of roughly 10,000 youth trained. However, no impact evaluation was implemented during this period and the partnership was discontinued due to a government change, leaving the program administrators with the task of finding a new model of operation that would not rely on public funding. In 2009, the program was rather small, with 4-5 cohorts of youth per year and cohort sizes of roughly 100 students.

3.3   Design and implementation of the Randomized Controlled Trial (RCT)

The youth from Rio's *favelas* to be treated by *Galpão* are selected in a two-stage process. In the first stage, all youths responding to the announcement of a new cohort are given a "pre-inscription" questionnaire that includes information related to personal and household situation, current employment, educational status, etc. This stage is essentially a "screening" stage ensuring that youth meet the eligibility criteria: Only those from households with monthly income below two minimum wages are eligible; also, youth who have aged out of the program (over 29 years old) are not allowed to apply. In a second stage, eligible youth are contacted and are required to undertake an interview process and to take a Mathematics and Portuguese test. According to the number of slots available, the best-performing youths of the math and language tests are invited to enroll in the program. The interview attempts to identify youth who are currently involved in drugs or gang activity; those are not offered a slot, regardless of their academic performance.

Given that the program was oversubscribed, it was possible to employ an experimental design to evaluate the program, by which eligible beneficiaries would be randomly assigned to either a treatment or a control group. The randomized selection was double blinded.[7] Program administrators called applicants and advised them of their status, and applicants that were randomly selected-in were allowed to enroll. The experiment was also structured with an exception mechanism that allowed *Galpão* administrators to exclude certain individuals from the process of random assignment.[8] These *pre-selected* individuals were identified before the randomization took place and excluded from the experiment; they were allowed to enroll immediately and were not part of the lottery (although the same baseline and follow-up data

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[7] The program administrator sent the names and identification numbers of the applicants, and the researchers conducted the randomization based on a standard random number generator corresponding to the total size of the proposed study sample, with equal probability of inclusion and exclusion. The researcher assigning the random numbers to ID numbers was not aware of beneficiaries' names. The random numbers generated were then re-matched to the beneficiary names by a second researcher, and the names randomly selected-out and selected-in were communicated to the program administrators.

[8] Administrators identified individuals who would have to be offered the program based on need, as well as those who were particularly high achievers (high-scoring individuals on the Math and Portuguese tests) from very disadvantaged backgrounds. Also, in specific instances when siblings applied to the program, excluding one might have resulted in resentment. All these cases were deemed "pre-selected" applicants. It was agreed between researchers and program administrators that the maximum number of pre-selected individuals should not exceed 10 per cent of the total study sample. The eventual number of pre-selected cases was rather low, amounting to less than 6 per cent of the study sample size.

were collected on them, adding further information to our analysis). This procedure is routinely used in experimental designs to avoid problems with potential control units being treated by the program <u>after</u> the randomization. This type of contamination occurred, for instance, in both the cases of *Juventud y Empleo* in the Dominican Republic and *Jovenes en Acción* in Colombia. Furthermore, it was agreed that the program administrators would keep the treated and control units ignorant of the possibility of future participation to eliminate biases in impact estimates based on expectations of future treatment.[9]

The experiment was put into practice in alignment with the program's cohort structure, in order to not interfere with program operation. The treatment we analyze was rolled out in three cohorts over time, the first cohort starting in April 2012, the second in June and the third in July 2012. For each cohort, youths were randomly assigned to treatment and control groups, and baseline and follow-up data collected. In total, 451 applicants who met the eligibility criteria were identified during the registration process. Table 3 presents the applicants' distribution broken down by treatment status for the entire sample. There were no instances of "always-takers/non-compliers" as no controls were able to enroll post-randomization. Just above 10 per cent of those originally assigned to the treatment group were "never-takers/non-compliers", as they failed to show up for the training.

< Table 3 about here >

3.4   Data Collection

The baseline data were collected between June and October 2012 and include 380 individuals, 162 in the treatment group, 195 in the control group, and 23 non-randomly assigned treated youths (*pre-selected*). The Brazilian firm *Overview Pesquisa* carried out the surveys implementing comprehensive interview protocols for *favela* youths, a process that in practice required multiple visits to the same neighborhoods. According to *Overview Pesquisa*, in these neighborhoods with high rates of violent crime, the hazard rate of potentially dangerous

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[9] However, this strategy turned out to produce significant frustration on the part of the control group, and was eventually dropped. Indeed, most of the problems with data collection were derived from the ill-will generated when controls found out that they would not be eligible to apply in the future. This could produce negative John Henry effects, and therefore was discontinued for data collected after the first cohort.

confrontations with drug gangs increases rapidly with the time that the survey team remains in the field, as gangs rapidly become aware of their presence. This necessitates frequent short visits to the neighborhoods.

The vast majority of interviews took place face-to-face in the households where the youths live. In a small percentage of cases (8 per cent), surveys were administered in different locations, because youths had told the enumerators to avoid visiting their communities altogether for security reasons. Furthermore, in order to minimize the non-response rate, the survey firm made sustained attempts to track and interview youths. After three unsuccessful attempts had been made, a monetary incentive was offered to encourage the participants to complete the questionnaire (Eventually six youths took up the monetary incentive). This strategy was required mostly for the control group, and mostly from the first cohort. As a result of these combined efforts, only 16 per cent of the original group could not be interviewed.

After the completion of the program, a first follow-up survey was conducted. The data collection proceeded in identical fashion. Eventually, *Overview Pesquisa* managed to interview a total of 348 youths in the follow-up survey, comprising 150 youths in the treatment group, 178 in the control group, and 20 pre-selected youths. This sample represents 77 per cent of the initial group at random assignment. This attrition rate is similar to those found in other impact evaluations – with randomized design – of youth training programs in LAC.[10]

The cohort structure, along with the timing at which the surveys were fielded, produced variation in the time since program completion for different cohorts. Because follow-up data were collected at different points in time for each of the three cohorts, and because the different cohorts finished the program at different points in time, the time elapsed since program termination and follow-up collection was significantly different across cohorts: On average, 1-2 months had elapsed for cohort 1, 4-5 months had elapsed for cohort 2, and 2-3 months had elapsed for cohort 2. The ranges reflect the fact that field work was typically done over a four-week period given the intensive data collection efforts (see above), so even within a cohort some participants will have been interviewed before others. In the case of the 2nd cohort the period

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[10] Entra 21 in Argentina (81.5 per cent), Juventud y Empleo in Dominican Republic (about 80 per cent in the second evaluation), and Jóvenes en Acción in Colombia (81.5 per cent). See Alzua et al. (2013), Ibarraran et al. (2012), and Attanasio et al. (2011).

between the data collection and the end of the training was the longest. This feature will be exploited to compare the results of the cohorts with different *post-program periods*.

4   EMPIRICAL RESULTS

4.1   Descriptive analysis of the baseline data

Tables 4 through 6 present balancing results for observable characteristics at baseline – i.e. at random assignment for socio-demographic covariates (Table 4), for social activities and risky behavior (Table 5), and for life skills (Table 6). In all three tables we first present means for the treatment and control groups – columns (1) and (2) – and corresponding t-tests on differences-in-means – columns (3) and (4) – to assess balancing. The treatment and control groups reported in these four columns are youths for which data at both the baseline and at follow-up are available, and these constitute the main balancing results.

Additional balancing results are presented in the columns to the right in each of the Tables 4 through 6: Column (5) shows the means for the subgroup of *pre-selected* youth, which are then – in t-tests in columns (6) to (9) – compared to the main sample. Similarly, column (10) displays baseline averages for the group of youths that could not be reached in the follow-up, and columns (12) and (13) investigate whether there is any indication that this attrition from the sample is systematic.

< Table 4 about here >

The general picture of the summary statistics indicates that the youths in our sample are on average around 23 years old and predominantly male (Table 4). Only about 13 per cent are women, which is in line with the type of vocational and technical training offered in the program. The households in which these youths live have an average of about 4 household members. Almost all (97 per cent) report that they can read and write. They are typically not recipients of social benefits like the *Bolsa Familia* or *Familia Carioca,* although the low frequency (1-2 per cent) may somewhat underestimate the true incidence, since youth who still live at home may be unaware of the recipient status of their mothers or sisters.

The majority of youth (85 per cent) have completed secondary education, and the vast majority already worked before. *Galpão* is clearly not targeting the immediate school-to-work transition. The data also show that the proportion of youth who work with formal contracts (*com carteira assinada*) is also relatively high, at around 70 per cent. Although this is lower than the overall average for youth in the city according to the PME, it is still quite high. Those employed are not high earners, but they are also not among the poorest. The average monthly reported earnings is roughly R$750. This is above the R$622 minimum established by federal law (2012), but below the R$756 established for Rio de Janeiro. Although these are youth from disadvantaged neighborhoods – *favelas* – they are also youth living in one of the wealthiest cities of Brazil, where access to public services is relatively good, and where labor markets have produced improvements in wages and employment over the last few years.

The baseline also identifies specific instances which are typically related to risk factors among youth (Table 5). The first is the relatively high frequency with which these youth observe violence, or are victims of violence. For instance, roughly a quarter of the youth reported witnessing an incidence of violent crime in the past year, and a full third of them reported witnessing the use of a firearm. Both of these figures are particularly high. Another 17 per cent reported being the victim of discrimination, and 31 percent report having witnessed some form of violent attack. Other risk factors recorded through the instrument include the use of alcohol, tobacco, and drugs. More than half of those interviewed reported the consumption of alcohol in the past week, but only a fifth reported having smoked. There was virtually no reported use of drugs, although it is unclear if youth would have been comfortable reporting this metric given the lack of privacy in the interview context (Aquilino, 1997). And in many aspects these *favela* youth are very much like others: they attend church (48 per cent), the play sports regularly (70 per cent), and they go out at night (75 per cent).

< Table 5 about here >

In this study we use two instruments to measure socio-emotional development: the Grit scale and the Social and Personal Competencies Scale (CPS). The Grit scale measures persistency of effort, enthusiasm about long term goals, consistency of interests, and ambition. The Grit scale is related to the personality trait of *Conscientiousness* (Duckworth et al., 2007). The CPS was

developed by the IDB to measure socio-emotional development in the context of the *Juventud and Empleo* program (Brea, 2010; Ibarraran et al., 2012). It measures six basic competencies: i) leadership; ii) behavior in situations of conflict; iii) self-esteem; iv) abilities to relate with others; v) order; and, vi) empathy and communication skills (both tests are discussed in Annex 2).

The baseline data in Table 6 show that the youth for the most part do not exhibit particularly extreme values in the tests applied. The median total score on the Grit test is of 34. When normalized according to the standard Grit scale (Duckworth et al., 2007), the average is of 4.25, which is actually relatively high on the scale. The results on the CPS scale are similar. This may be due to a positive self-selection on personality traits: youth may be higher scoring on the personality characteristics of conscientiousness because this personality trait may in fact be responsible for them seeking out the program to begin with.

< Table 6 about here >

In general, we find that treatment and control groups are relatively well balanced at random assignment (compare columns (3) and (4) in each of the Tables 4, 5 and 6). The majority of covariates do not display significant differences in mean values. Some covariates, however, do show significant differences: the share of single youth, for instance, is 9 percentage points smaller in the control group (marginally significant) and the household size in the treatment group is significantly larger (Table 4). More immediately related to the labor market is the significant difference in the age at first job (16.4 vs. 15.6 years of age in the treatment vs. control). While not significant at conventional levels (t-stat of 1.61), the difference in the fraction of youths who are employed in some job is quite large: 69.1 per cent in the control group and 60.5 per cent in the treatment group. Similarly, whereas the majority of covariates capturing social activities, risky behavior and life skills are well balanced, some differences are worth noting. In particular, the control group attains significantly higher scores on two subscales of the CPS scale, CPS Conflict and CPS Order, resulting in a marginally significant overall difference in the CPS scale (Table 6). Taken together, these balancing results might indicate that the control group is marginally better in key pre-treatment outcomes (labor market and life skills) at random assignment. This observation will lead us to implement difference-in-difference methods to estimate program impacts.

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The summary statistics from Tables 4 through 6 (columns 5-12) also show that there are very few differences between those who were re-interviewed and those who attrited. The results indicate that the youth in our sample do not systematically differ in observed covariates from those 33 youths that were not available for follow-up data (see columns 10-12): In fact, the majority of covariate averages is not significantly different between followed-up and not-followed-up youths; and while some significant differences in a few variables can be seen in Tables 4-6, columns 10-12, these do not concern key variables and thus do not suggest at all that there is a systematically different group of not-followed-up youths. Rather, the few imbalances seem to be entirely random. Moreover, we find no evidence that participants assigned to the treatment group attrite differently from those assigned to the control group, suggesting that selection into the sample is not a source of concern.

Finally, Tables 4 through 6 also show that the *pre-selected* youth are very similar to those randomly assigned to treatment (see columns 5-9 in each of the tables). The sole exception is a somewhat better performance of the pre-selected in some subscales of the CPS life skills scale (Table 6). Because of the absence of systematic differences between the *pre-selected* youth and the youth randomly assigned to treatment, we will pool the two groups into a joint treatment group for some of our impact estimates.

4.2 Impacts on labor market outcomes

Given random assignment, the simple comparison of average outcomes between treatment and control groups suffices to estimate unbiased mean impacts of the program. In this specific context, however, some adjustments to this "raw" effect are conceivable. First, given that the results of the balancing analysis in the previous section indicate that despite random assignment treatment and control groups may slightly differ in pre-treatment outcomes, one might want to adjust for any such pre-treatment differences. Second, one might consider including the *pre-selected* youth – which were found to be very similar to the treatment group – to form a joint treatment group to increase the sample size.

In light of these considerations, our main results are based on a specification estimating treatment effects using a difference-in-difference (DiD) model,

$$Y_{iwt} = A_w + B_t + \beta T_{wt} + \varepsilon_{iwt} ,$$

where Y_{iwt} is the outcome of interest for individual i in wave w (baseline or follow-up) who is exposed to treatment t or not. A_w and B_t are fixed effects for wave and treatment status, and T_{wt} is a dummy variable indicating whether the intervention has affected group t at time w. We estimate the impact of the program using the OLS estimate $\hat{\beta}$. Tables 7 through 9 present corresponding estimates $\hat{\beta}$ of the impact of *Galpão*. The specification presented here includes the *pre-selected* youth into the treatment group; it also adjusts for observed covariates. Tables A1 through A3 in the appendix comprise the results of a sensitivity analysis using an unadjusted DiD specification without the *pre-selected* youth. The appendix tables show that the results are very similar both in quantitative and qualitative terms (a finding that also holds when implementing a single-difference specification, the results of which are available on request).

The richness of the data collected during the in-depth face-to-face interviews with the youths allows us to estimate program impacts for a whole series of outcomes, comprising labor market results (Table 7), social activities and risky behavior (Table 8), and socio-emotional skills (Table 9). Each of the tables first reports impact estimates for the full sample, and then separately for three subsamples differentiated by the elapsed time since graduating from the program, specifically 1-2 months post-program (as measured by cohort 1), 2-3 months post-program (cohort 3), 4-5 months post-program (cohort 2), respectively (see also the discussion in section 3.3).

< Table 7 about here >

While Table 7 indicates that there are no significant overall employment and earnings impacts for the full sample, the results show that there is a considerable dynamic in program impacts during the short-term period after graduation: The DiD estimator for the full sample (1st panel of Table 7) shows no significant differences between treatment and control groups in the likelihood of working, working for gainful employment, earnings, or the probability of having a formal job. This finding is mirrored in the treatment effect estimates for the time period immediately after the program, which also do not detect any significant differences in outcomes due to the program (2nd and 3rd panel). The dynamic arises, however, in the subsequent months (4th panel): After 4-5 months elapsed time we find a significant and large (21.3 percentage

points) treatment effect on the probability of having a job. This effect is more pronounced for the probability of having a salaried job (26.6 percentage points, statistically significant).

The notable employment impacts are accompanied by a significant (t-stat 1.95) estimate of the effect on monthly earnings in the size of R$ 177 (USD 84). Relative to the sample average of monthly income before the program, this coefficient implies a 23.6 per cent increase. The employment impact identified above is even larger: relative to the sample average prior to enrolment into *Galpão*, the program increased the employment probability of participants by 33.3 per cent. These are economically very large impacts. In line with the increase in labor earnings, Table 7 also indicates a significant increase in the probability that "saving money" is the main expense for youths.

Against the background that the evidence on youth training reviewed above clearly shows that classroom training programs tend to have small or no impacts in the short run (before 6 months), the fact that we find positive and sizeable effects within 4-5 months are quite surprising. In addition, although the findings for months 1-2 and 2-3 post-program are not significant, their sign and magnitude are consistent with a hypothesis of youths increasingly recovering from the short-run *sequestration* or *lock-in* effect of the program and beginning to attain some of the program's purported positive employability effects. Of course, since the treatment effect for the time period 4-5 months post-program is estimated on a relatively small sample, these results – and the dynamic from short- to long-term – should be confirmed with the full sample of treated individuals, once all of them have had time to recover from the program's *sequestration* effects, in the final long-run follow-up survey scheduled for 2014.

In addition, the impact estimates on labor market outcomes also stand out from the existing literature in that it does not seem that the program is producing a significant impact on the formality of jobs. Formal employment is perhaps the only dimension in which most other rigorously evaluated training programs in LAC—such as *Juventud and Empleo*, *Jovenes en Acción*, and *Entra21—* have been able to impact, and it is somewhat surprising that early *Galpão* results do not suggest that it impacts formality. A couple of remarks, however, should be made on this. First, as was documented above, the percentage of formal jobs rose particularly fast in Rio from the first half of 2012 to the first half of 2013. And formality was already relatively high in Rio de Janeiro compared to other areas in developing countries; in particular in other places where evaluations of similar programs targeting youth labor market integration had been

conducted. Second, unlike other programs evaluated, *Galpão* does not rely on a subsidized internship with a formal job. To the extent that this temporary internship may become permanent, the proportion of formal jobs may be impacted.

4.3   Impacts on social activities and risky behavior

Table 8 adds to the labor market results by presenting ATET estimates for a set of outcomes measuring social activities and risky behavior. The results indicate no early impacts on any of the measured risk-related outcomes. The only significant difference is a higher share of youths in the treatment group that reports having been the victim of physical aggression, but given the very low absolute number reported here, this result may be spurious and is likely not related to the program. Three important caveats should be noted. The first is that the selection of individuals into the *Galpão* program explicitly excludes potentially eligible youth who display signs of the worst risk factors, such as, for instance, drug use or gang membership. And by selecting students based on test scores, the program is also likely incidentally selecting against high-risk youth. Second, some of the questions asked in the survey—particularly those related to availability of a firearm, victimization, and drug use—may encounter validity problems due to well-documented biases, particularly in contexts with limited privacy. And lastly, the retrospective timeframe used in the risky behavior questions is much longer (the last year) than the one used in labor market outcomes (the week before the intervention), so if respondents are answering accurately, they may be recounting experiences that took place before the program.

< Table 8 about here >

4.4   Impacts on socio-emotional skills

The final set of outcomes we can consider covers measures of socio-emotional (non-cognitive) skills. These are presented in Table 9. We report impact estimates as z-scores, which are calculated as the difference of the individual test score and the mean test score of both groups, divided by the standard deviation of the test score in both groups. That is, for instance, the coefficient on the "CPS total" score for the full sample in Table 9 implies that the CPS total score for individuals assigned to the treatment group is 0.09 standard deviations lower than the CPS total score for the control group. This explanation is just for illustration, however, since the

point estimate is not significant (t-stat -1.25). The CPS and Grit scales, respectively, are explained in more detail in Annex A2.

< Table 9 about here >

Similar to the results for social activities and risky behavior, we find few significant program impacts on levels of socio-emotional development. There only seems to be a slight indication of lower results for the treatment group in some dimensions of the Grit scale. The outcomes presented in Table 9, however, may be the one case for which perhaps the DiD estimator is inappropriate, given that the baseline for the study was typically done at the beginning of the program. In the case of labor market outcomes, the questionnaire clearly identified the reference week at baseline as the week before the program. But since the data collected in both Grit and CPS do not depend on recall and rather imply contemporaneous reporting regarding perceptions and values, they will necessarily reflect the state of mind at the time the data was collected (Duckworth et al., 2007). This state of mind, in turn, may have been impacted by early participation in the program, in a direction which is not immediately evident.

To address this issue, the single-difference estimator is likely a better way to assess program impacts on life skills: if program baseline values were indeed already altered by participation, this would not bias the estimator. We report the corresponding results in Table A4 in Annex 3. Indeed, the previously significant results in the period 4-5 months seem to have been affected by the process just described, and the coefficients are smaller and insignificant now. At the same time, a few significant negative coefficients arise for the immediate post-program period (1-2 months), indicating at the very least that short-term perseverance was not positively affected by the program. Nonetheless, there is no overall pattern in the impacts on socio-emotional traits, as measured by psychological tests, and results are rather inconclusive. In fact, the absence of consistent results suggests that socio-emotional skills, although evolving over the life-cycle, may be difficult to shape through employment training programs, at least in the short run.

5 DISCUSSION

This paper presents an empirical analysis of an innovative youth training program in Rio de Janeiro, which combines technical with life skills training by using arts-based training protocols. The program is targeted at disadvantaged, *favela* youth and is designed to teach socio-emotional skills using expressive arts. We implement a randomized controlled trial to assess the effectiveness of the program. Our analysis contributes to the literature on youth training and on the role of socio-emotional skills in the labor market in a number of different and relevant ways.

First, the program provides the first instance of a rigorous evaluation, based on a randomized trial, of an arts-based employment-generation program for at-risk youth. There are no other such evaluations, to the authors' knowledge. As such, the paper provides additional evidence on the toolkit that policy-makers have to address youth employment—or the precarious nature of youth employment. The findings are suggestive that the "*Galpão* model" can be an effective alternative to traditional pedagogic approaches to youth training. The evidence we present shows that for youth who have been out of the program for only four to five months, employment prospects are much improved, as are earnings. The effects are not seen for youth cohorts who have had fewer months since program completion. However, this is consistent with the evidence that shows program effectiveness increasing over time, and indeed showing negative program impacts in the short run, for several studies (Card et al., 2010). Our estimates at 4-5 months post-program are significant and large, indicating a 33.3 per cent improvement in the probability of being employed, and a 23.6 per cent increase in monthly earnings.

The data also show, somewhat surprisingly, that the program has no impact on the formality of jobs. This is contrary to the evidence on almost all other youth training programs, which show, if anything, limited impacts on earnings and employment, but positive impacts on formality. This may be due to a number of reasons, among which two in particular stand out. The first is that the program's context is quite particular. Rio de Janeiro already enjoys relatively high levels of formality, even among youth, and this level rose fast during the evaluation period. And these levels have been increasingly steady over time. This is quite different to the contexts in the Dominican Republic or Colombia, where the incidence of informality during the years in which their respective programs were evaluated were particularly high.

Another possible explanation is in the program structure itself: *Galpão* does not have a structured internship. Perhaps it should. Whereas other programs evaluated relied on a network

of firms who received subsidized interns, *Galpão's* labor intermediation strategy was based on ad hoc alliances with particular private sector actors, but youth were mostly left on their own to find jobs. This means that other programs automatically placed youth in formal jobs—and at the end of the internship, some would remain, and some would exit. This demand-driven component of youth training has been interpreted as one of the success factors of such programs in LAC (Urzúa and Puentes, 2010). By targeting formal firms with formal jobs to begin with, the labor intermediation strategy may be more effective at generating formality than *Galpão*.

Second, the program contributes to the evidence of the role of socio-emotional skills in the context of labor markets. The estimates show some positive short-run impacts, but there is no pattern in the results. The program by and large does not seem to be impacting beneficiaries' performance on standardized psychological measures of socio-emotional skills. In particular, skills related to conscientiousness and perseverance seem unaltered by the program. This is a surprise, given the program's self-declared model of using these skills as ways of teaching other skills (Portuguese, Mathematics, vocational), and given the overall existing literature on the importance of these skills, including in labor markets. But there are possible explanations. The first story is one of selection. We saw that at baseline program participants actually score high on the Grit scale. This may indicate that the program may be attracting youth who already possess these skills. If so, the role of the skills may actually be to help develop more conventional cognitive skills, such as literacy, numeracy, and other functions which are also taught. This would be consistent with the literature that suggests that early development of skills, such as socio-emotional skills, may facilitate development of cognitive skills later in life. This is what some authors have termed as *dynamic complementarities* in skill formation (Carneiro and Heckman, 2003; Heckman and Masterov, 2007). This would also not necessarily be inconsistent with the evidence that identifies contemporaneous correlations between socio-emotional skills and labor outcomes, since these studies were largely done based on a random sample of all young adults using household surveys (Diaz et al., 2012) and not necessarily based on self-selected youth. Nonetheless, anecdotal evidence suggests that *Galpão´s* youth display better performance in skills valued by the labor market compared to their peers (i.e. punctuality, responsibility, dedicated to their work). We intend to examine these types of skills to complement the measures of personality traits in the final follow-up survey.

Third, the paper provides some preliminary novel evidence on the dynamics of treatment effects over time. And although there exist more comprehensive longitudinal data on this subject (e.g. Caliendo et al., 2011), they are in a way always subject to the inescapable critique of confounding. Ours is one of the first experimental approaches that provide evidence on how the dynamics of treatment evolve over time, particularly for ALMPs targeted at youth. And the initial evidence strongly suggests that youths may overcome the *sequestration* effect of training early on.

We would be remiss if we did not finalize this paper with one caveat: our analysis is not an evaluation of a public policy. *Galpão* was, in its early phase, an instrument for public policy, as it was used by municipal authorities as a vehicle for wide-scale youth training for the city. But the fickle nature of that relationship—the partnership was terminated when the City's government changed—is precisely what forced *Galpão* to adopt a private-sector oriented strategy. Now it is a private initiative that is much more selective in its approach, in its identification of private-sector partners, and even in its targeting of beneficiaries. This selective nature of the program introduces a complexity in the interpretation of the results. Are employment gains being driven by human capital formation—either in cognitive or socio-emotional skills—or are they driven from the program's ability to *signal* "higher quality" youths that the program was able to positively select? The data available really do not allow us to test between these two hypotheses. Interviews with employers clearly show that they value the program's quality seal. They mention that *Galpão* youth are more responsible, more driven, more reliable, and possess better technical skills. But this may be as much selection as it is human capital formation. The most likely scenario is that both are at play, but exactly how much is selection and how much is skills enhancement, remains unclear.

In this sense, the precise replicability of *Galpão* to a wider population—such as would be the case in a large-scale public program—may be problematic: there are just too many variables which are *sui generis* to the program for us to think that these results would necessarily hold potential for external validity. A broad public training program open to all youth would certainly not be as selective, and as such would not be able to signal *ex ante* quality to potential employers. And to the extent that skills acquired during *Galpão* complement the relatively high levels of cognitive ability recruited, a broader policy may also be unable to deliver comparable results. At the same time, the broader relevance of the results come from the fact that they

corroborate the hypothesis that multi-component programs are more effective for youths. In fact, whereas the life skills training does not seem to translate into increased test scores on non-cognitive skills per se, it may constitute precisely the complementing and necessary channel through which outcomes in vocational skills are particularly successful, thus bringing about the positive and large labor market impacts already in the short run.

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Table 1. Trends in labor market indicators in Rio de Janeiro and other metropolitan regions, 2010-2013

	Unemployment rate %				Employment share of manufacturing			
	All		Youth		All		Youth	
	Rio	Other MRs	Rio	Other MRs	Rio	Other MRs	Rio	Other MRs
2010	5.9%	7.8%	11.5%	14.2%	20.1%	25.5%	18.1%	24.6%
2012	5.5%	6.0%	11.2%	11.3%	19.8%	25.4%	18.8%	24.8%
2013	4.8%	6.0%	10.1%	11.4%	19.5%	24.9%	18.7%	23.9%

MRs = Metropolitan Regions
Source: Authors using data from the *Pesquisa Mensal do Emprego (PEM)*.

Table 2. Trends in job quality indicators in Rio de Janeiro and other metropolitan regions, 2008-2012

	Informality rate % (private sector)				Average labor earnings			
	All		Youth		All		Youth	
	Rio	Other MRs	Rio	Other MRs	Rio	Other MRs	Rio	Other MRs
2010	20.7%	21.0%	25.8%	24.4%	1	0.968	0.652	0.647
2012	18.8%	17.4%	23.3%	20.6%	1.236	1.172	0.799	0.811
2013	17.0%	16.4%	21.5%	19.9%	1.349	1.263	0.910	0.865

MRs = Metropolitan Regions; trends in earnings are reported using a normalized index (Rio in 2010 = 1).
Source: Authors using data from the *Pesquisa Mensal do Emprego (PEM)*.

Table 3. Treatment status of youths

	Randomly assigned to treatment group	Randomly assigned to control group	Pre-Selected	Total
Participated in the program	173	0	24	197
Did not participate in the program	21	230	3	254
Total	194	230	27	451

Source: Authors using data from the *Galpão* program administration.

Table 4. Covariate Balancing (i) – Sociodemographic characteristics

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)	(13)
	Treated	**Control**	Mean diff. Treat vs. Control	T-Value	**Preselected**	Mean diff. Treat vs. Preselected	T-Value	Mean diff. Treat incl. Preselected vs. Control	T-Value	**Not in follow-up**	Mean diff. Followed-up vs. Not in follow-up	T-Value	N
Age	22.78	23.20	-0.42	-0.94	22.26	0.52	0.52	-0.48	-1.11	23.55	-0.58	-0.80	377
Fract. Females	12.90	14.60	-1.70	-0.44	5.26	7.64	0.96	-2.56	-0.70	3.03	*10.30*	*1.72*	377
Fract. Single	78.20	69.10	*9.10*	*1.85*	84.20	-6.00	-0.60	**9.81**	**2.08**	69.70	4.14	0.51	377
Fract. Lives with father	36.70	31.50	5.20	1.00	47.40	-10.70	-0.90	6.49	1.26	33.30	1.26	0.15	377
Fract. Lives with mother	41.50	37.10	4.40	0.81	63.20	-21.70	-1.80	6.90	1.30	45.50	-5.05	-0.56	377
Fract. Familia Carioca benefit	1.36	1.12	0.24	0.19	5.26	-3.90	-1.20	0.68	0.53	0.00	1.45	0.70	377
Fract. Bolsa Familia benefit	1.22	1.18	0.04	0.12	10.50	-9.28	0.22	0.25	0.07	9.09	2.83	0.48	377
Fract. No social benefit	87.10	88.20	-1.10	-0.31	84.20	2.90	0.34	-1.46	-0.41	90.90	-3.41	-0.57	377
Household Size	3.98	3.57	**0.41**	**2.24**	3.53	0.45	1.11	**0.36**	**2.05**	3.33	0.41	1.39	377
Household Income	1719.50	1560.30	159.20	1.17	1383.20	336.30	1.13	120.70	0.91	1758.70	-140.20	-0.64	377
Fract Literate persons in HH	97.40	96.70	0.70	0.69	100.00	-2.60	-1.28	1.03	1.03	97.10	0.05	0.03	377
Monthly Rent	317.40	331.80	-14.40	-0.51	345.00	-27.60	-0.30	-12.47	-0.45	503.80	***-176.60***	***-4.15***	90
Fract. Official int. water access	73.50	67.40	6.10	1.19	78.90	-5.40	-0.51	6.68	1.36	81.80	-11.20	-1.36	377
Fract. Pay Water	49.00	40.40	8.60	1.54	36.80	12.20	0.99	7.14	1.33	51.50	-7.62	-0.84	377
Fract. Ever worked	93.20	94.90	-1.70	-0.67	84.20	9.00	1.37	-2.78	-1.05	100.00	-6.40	-1.50	377
Age at first job	16.36	15.59	**0.77**	**2.24**	15.88	0.48	0.65	**0.72**	**2.16**	16.00	-0.07	-0.13	355
Fract. Employed	60.50	69.10	-8.60	-1.61	42.10	18.40	1.54	**-10.70**	**-2.07**	69.70	-5.74	-0.66	377
Fract. Unemployed	17.70	16.30	1.40	0.33	10.50	7.20	0.78	0.58	0.14	21.20	-4.64	-0.68	377
Monthly labor income	744.00	760.50	-16.50	-0.34	721.30	22.70	0.23	-19.11	-0.41	858.30	-106.10	-1.42	216
Weekly hours worked	41.97	42.75	-0.78	-0.39	42.40	-0.43	-0.08	-0.73	-0.35	42.10	0.33	0.10	218
Fract. Formal Contract	69.50	71.40	-1.90	-0.25	75.00	-5.50	-0.31	-1.28	-0.17	58.80	12.00	1.02	168
Contribution Share	2.33	2.49	-0.16	-0.89	2.22	0.11	0.26	-0.17	-0.99	2.21	0.20	0.73	203
Fract. Secondary Education	84.80	87.10	-2.30	-0.53	92.90	-8.10	-0.81	-1.43	-0.33	89.30	-2.80	-0.41	287
N	147	178			19					33	344		

Table 5. Covariate Balancing (ii) – Social activities and risky behavior

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)	(13)
	Treated	**Control**	Mean diff. Treated vs. Control	T-Value	**Preselected**	Mean diff. Treated vs. Preselected	T-Value	Mean diff. Treated incl. Preselected vs. Control	T-Value	**Not in follow-up**	Mean diff. Followed-up vs. Not in follow-up	T-Value	N
Fract. Party	74.80	71.30	3.50	0.70	57.90	16.90	1.56	1.54	0.32	81.80	-9.73	-1.20	377
Fract. Volunteering	27.20	28.10	-0.90	-0.18	31.60	-4.40	-0.40	-0.38	-0.08	27.30	0.63	0.08	377
Fract. Sports	69.40	62.40	7.00	1.33	73.70	-4.30	-0.38	7.52	1.47	60.60	5.38	0.62	377
Fract. Church	48.30	51.70	-3.40	-0.61	47.40	0.90	0.08	-3.49	-0.65	45.50	4.55	0.50	377
Fract. Ever smoked	19.00	24.70	-5.70	-1.22	36.80	*-17.80*	*-1.80*	-3.63	-0.80	45.50	***-22.50***	***-2.88***	377
Fract. Last week alcohol	52.60	59.30	-6.70	-0.70	50.00	2.60	0.14	-6.95	-0.76	46.20	9.31	0.64	132
Fract. Witnessed firearms last year	37.40	36.50	0.90	0.17	36.80	0.60	0.05	0.83	0.16	51.50	*-14.60*	*-1.65*	377
Fract. Witness phys. attack last year	30.80	25.80	5.00	0.99	15.80	15.00	1.36	3.25	0.67	33.30	-5.93	-0.72	376
Fract. Victim: discrimination	17.00	19.10	-2.10	-0.49	10.50	6.50	0.72	-2.84	-0.69	30.30	*-12.60*	*-1.77*	377
Fract. Victim: threatened	0.68	3.93	*-3.25*	*-1.89*	0.00	0.68	0.36	**-3.33**	**-2.05**	6.06	-3.74	-1.27	377
N	147	178			19					33	344		

Note: T-values are for t-tests on differences-in-means. Significance levels are indicated by italics (10%), boldface (5%), and boldface+italics (1%).

Table 6. Covariate Balancing (iii) – Life skills

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)	(13)
	Treated	**Control**	Mean diff. Treated vs. Control	T-Value	**Preselected**	Mean diff. Treated vs. Preselected	T-Value	Mean diff. Treated incl. Preselected vs. Control	T-Value	**Not in follow-up**	Mean diff. Followed-up vs. Not in follow-up	T-Value	N
CPS Total	94.06	96.28	-2.22	*-1.74*	97.95	-3.88	-1.35	-1.77	-1.44	93.82	1.61	0.76	377
CPS Leadership	13.90	14.16	-0.26	-0.79	15.32	**-1.41**	**-2.01**	-0.09	-0.30	13.42	0.69	1.31	377
CPS Conflict	20.03	21.18	*-1.15*	*-2.88*	21.89	**-1.86**	**-2.16**	*-0.93*	*-2.40*	21.52	-0.79	-1.15	377
CPS Selfesteem	8.91	8.84	0.07	0.38	8.63	0.27	0.70	0.04	0.21	8.39	0.46	1.59	377
CPS Relate	10.83	10.99	-0.16	-0.70	11.11	-0.28	-0.53	-0.13	-0.57	10.21	*0.72*	*1.88*	377
CPS Order	12.34	13.10	*-0.76*	*-2.66*	13.63	**-1.29**	**-1.99**	**-0.61**	**-2.20**	12.61	0.20	0.42	377
CPS Empathy	27.45	27.43	0.02	0.05	26.89	0.55	0.57	-0.04	-0.09	26.97	0.44	0.59	377
Grit Total	54.44	54.96	-0.52	-0.83	55.58	-1.14	-0.85	-0.39	-0.64	54.48	0.29	0.28	377
Grit Short	34.73	34.96	-0.23	-0.58	36.00	-1.27	-1.51	-0.08	-0.21	35.06	-0.14	-0.22	377
Grit Consistency of Interest	11.76	11.78	-0.01	-0.04	11.89	-0.13	-0.21	0.00	0.01	11.88	-0.10	-0.20	377
Grit Perseverance	26.56	26.74	-0.18	-0.60	27.37	-0.81	-1.24	-0.09	-0.29	27.03	-0.34	-0.69	377
Grit Ambition	17.89	18.04	-0.15	-0.63	18.16	-0.27	-0.53	-0.12	-0.52	18.09	-0.11	-0.28	377
N	147	178			19					33	344		

Note: T-values are for t-tests on differences-in-means. Significance levels are indicated by italics (10%), boldface (5%), and boldface+italics (1%).

Table 7. Estimated impact of *Galpão Aplauso* on labor market outcomes, by post-program elapsed time

Outcome	Full Sample		1-2 months post-program (cohort 1)		2-3 months post-program (cohort 3)		4-5 months post-program (cohort 2)	
	Treatment Effect	t-value	Treatment Effect	t-value	Treatment Effect	t-value	Treatment Effect	t-value
Attends school	-0.039	-0.9	-0.003	-0.05	0.021	0.17	-0.144	-1.46
Last week job	0.051	0.8	-0.057	-0.65	-0.006	-0.04	**0.213**	**2.11**
Last week salaried job	0.078	1.22	-0.036	-0.4	-0.006	-0.04	***0.266***	***2.6***
Monthly labor income	30.264	0.57	-102.407	-1.51	252.864	1.6	*176.958*	*1.95*
Formal Contract	-0.017	-0.2	-0.106	-0.87	0.036	0.15	0.070	0.49
Indefinite Contract	-0.053	-0.81	-0.129	-1.41	-0.028	-0.19	0.080	0.59
Weekly hours	0.346	0.15	2.812	0.84	-7.986	-1.24	1.129	0.32
Contribution Share	0.075	0.41	-0.102	-0.43	0.584	1.18	0.170	0.54
Main Exp.: Study	0.019	0.85	0.024	0.81	-0.037	-0.97	0.066	1.14
Main Exp.: Save	0.020	0.46	-0.046	-0.76	0.016	0.15	**0.160**	**1.98**
Main Exp.: Party	0.056	1.07	*0.134*	*1.84*	-0.160	-1.22	0.045	0.44
Main Exp.: Technology	0.019	1.37	0.023	1.38	0.000		0.033	0.79
Main Exp.: Clothes	0.063	1.1	0.041	0.49	0.027	0.22	0.001	0.01

Note: Table entries on "Treatment effect" are covariate-adjusted DID estimates of the ATET. The treatment group includes the "pre-selected" youths. Full sample size is N=322, cohort 1=177, cohort 2=88, cohort 3=57. Significance levels are indicated by italics (10%), boldface (5%), and boldface+italics (1%).

Table 8. Estimated impact of *Galpão Aplauso* on social activities and risky behavior, by post-program elapsed time

Outcome	Full Sample		1-2 months post-program (cohort 1)		2-3 months post-program (cohort 3)		4-5 months post-program (cohort 2)	
	Treatment Effect	t-value	Treatment Effect	t-value	Treatment Effect	t-value	Treatment Effect	t-value
Party	0.093	1.65	0.190	2.56	-0.049	-0.34	-0.058	-0.47
Volunteer	-0.004	-0.08	-0.025	-0.36	0.095	0.71	0.035	0.32
Meet friends	0.011	0.23	0.000	0	0.022	0.19	-0.041	-0.41
Sports	0.053	0.98	-0.004	-0.05	0.137	1.03	0.119	0.98
Church	-0.060	-0.97	-0.180	-2.21	*0.237*	*1.67*	0.005	0.03
Help at event	0.045	0.76	-0.006	-0.07	0.143	1.11	0.065	0.49
Museum	0.038	1.04	0.057	1.14	0.076	0.64	0.017	0.26
Ever smoked	0.029	0.65	0.012	0.22	0.120	0.92	0.052	0.52
Last week nr cigarettes	-0.026	-0.1	-0.041	-0.1	0.179	0.18	-0.110	-0.22
Last week alcohol	-0.025	-0.47	0.017	0.25	*-0.262*	*-1.86*	0.038	0.31
Last week many drinks	0.064	0.48	-0.063	-0.36	0.230	0.77	0.444	1.7
Last month fight	0.017	0.9	0.033	0.96	0.000		0.000	
Witness firearms last year	0.115	2	0.123	1.6	0.030	0.17	0.100	0.8
Witness phys. Attack last year	0.053	0.87	*0.140*	*1.65*	-0.092	-0.65	0.024	0.21
Victim discrimination	0.065	1.2	0.043	0.58	0.066	0.43	0.106	0.98
Victim beaten	0.062	2.38	*0.088*	*1.94*	0.000		0.054	1.71
Victim threatened with arms	0.025	1.08	0.051	1.47	-0.005	-0.11	0.015	0.35

Note: Table entries on "Treatment effect" are covariate-adjusted DID estimates of the ATET. The treatment group includes the "pre-selected" youths. Full sample size is N=322, cohort 1=177, cohort 2=88, cohort 3=57. Significance levels are indicated by italics (10%), boldface (5%), and boldface+italics (1%).

Table 9. Estimated impact of *Galpão Aplauso* on life skills outcomes (z-scores), by post-program elapsed time

Outcomes ((Xi-Xc)/ c)	Full Sample		1-2 months post-program (cohort 1)		2-3 months post-program (cohort 3)		4-5 months post-program (cohort 2)	
	Treatment Effect	t-value	Treatment Effect	t-value	Treatment Effect	t-value	Treatment Effect	t-value
CPS Total	-0.100	-1.36	-0.084	-0.88	-0.046	-0.23	-0.026	-0.2
CPS 01	-0.043	-0.35	-0.030	-0.17	-0.102	-0.37	-0.006	-0.03
CPS 02	0.016	0.13	0.114	0.74	-0.395	-1.34	-0.059	-0.28
CPS 03	-0.166	-1.32	-0.131	-0.74	-0.026	-0.08	-0.375	-1.53
CPS 04	-0.049	-0.37	0.005	0.03	-0.320	-1.01	0.120	0.47
CPS 05	0.165	1.28	0.045	0.25	0.476	1.45	0.066	0.27
CPS 06	-0.173	-1.34	-0.161	-0.98	0.064	0.19	0.014	0.06
Grit Total	-0.045	-0.38	-0.070	-0.44	0.192	0.62	-0.261	-1.32
Grit Short	-0.027	-0.23	-0.039	-0.25	0.345	1.05	*-0.394*	*-1.66*
Grit 01	-0.194	-1.53	*-0.339*	*-1.85*	-0.028	-0.1	0.035	0.15
Grit 02	-0.005	-0.04	-0.047	-0.29	0.222	0.71	-0.190	-0.84
Grit 03	0.036	0.27	0.090	0.5	-0.015	-0.04	-0.206	-0.93
Grit Total - Duckworth	-0.065	-0.53	-0.156	-0.91	0.067	0.2	-0.056	-0.28
Grit Short- Duckworth	-0.141	-1.17	-0.250	-1.54	0.165	0.55	-0.215	-1.05
Grit 01 - Duckworth	-0.186	-1.45	*-0.336*	*-1.81*	-0.017	-0.06	0.069	0.28
Grit 02 - Duckworth	0.073	0.57	0.072	0.42	0.119	0.33	-0.131	-0.6
Grit 03- Duckworth	-0.004	-0.03	0.097	0.58	0.365	1.09	**-0.544**	**-2.09**

Note: Table entries on "Treatment effect" are covariate-adjusted DID estimates of the ATET. The treatment group includes the "pre-selected" youths. Full sample size is N=322, cohort 1=177, cohort 2=88, cohort 3=57. Significance levels are indicated by italics (10%), boldface (5%), and boldface+italics (1%).

Annex 1. Sensitivity Analysis

Table A1. Estimated impact of *Galpão Aplauso* on labor market outcomes, by post-program elapsed time

Outcome	Full Sample		1-2 months post-program (cohort 1)		2-3 months post-program (cohort 3)		4-5 months post-program (cohort 2)	
	Treatment Effect	t-value	Treatment Effect	t-value	Treatment Effect	t-value	Treatment Effect	t-value
Attends school	-0.050	-1.17	-0.017	-0.32	-0.034	-0.31	-0.132	-1.31
Last week job	0.018	0.3	-0.067	-0.78	-0.047	-0.33	*0.176*	*1.67*
Last week salaried job	0.043	0.65	-0.043	-0.46	-0.068	-0.46	**0.213**	**1.96**
Monthly labor income	49.654	0.87	-82.143	-1.17	242.022	1.55	**219.162**	**2.01**
Formal Contract	-0.001	-0.01	-0.079	-0.63	-0.02	-0.09	0.063	0.39
Indefinite Contract	-0.071	-1.11	-0.104	-1.2	-0.071	-0.5	0.004	0.03
Weekly hours	0.575	0.26	3.761	1.16	-7.898	-1.27	-0.441	-0.12
Contribution Share	0.030	0.15	-0.161	-0.66	0.569	0.97	0.162	0.39
Main Exp.: Study	0.015	0.65	0.022	0.81	-0.061	-1.43	0.077	1.22
Main Exp.: Save	0.018	0.45	-0.029	-0.51	0.024	0.25	0.094	1.28
Main Exp.: Party	0.032	0.63	0.109	1.58	-0.158	-1.37	0.005	0.05
Main Exp.: Technology	0.019	1.4	0.022	1.41	0		0.038	0.85
Main Exp.: Clothes	0.037	0.66	0.021	0.25	0.037	0.34	-0.044	-0.53

Note: Table entries on "Treatment effect" are <u>unadjusted</u> DID estimates of the ATET. The treatment group <u>excludes</u> the "pre-selected" youths. Full sample size is N=325, cohort 1=179, cohort 2=86, cohort 3=60. Significance levels are indicated by italics (10%), boldface (5%), and boldface+italics (1%).

Table A2. Estimated impact of *Galpão Aplauso* on social activities and risky behavior, by post-program elapsed time

Outcome	Full Sample		1-2 months post-program (cohort 1)		2-3 months post-program (cohort 3)		4-5 months post-program (cohort 2)	
	Treatment Effect	t-value	Treatment Effect	t-value	Treatment Effect	t-value	Treatment Effect	t-value
Party	0.079	1.37	*0.134*	*1.76*	0.020	0.15	-0.071	-0.55
Volunteer	0.016	0.31	0.010	0.14	0.061	0.51	0.028	0.23
Meet friends	0.025	0.51	0.016	0.23	0.098	0.87	-0.038	-0.34
Sports	0.069	1.28	0.028	0.39	0.141	1.22	0.144	1.19
Church	-0.011	-0.17	-0.129	-1.6	*0.246*	*1.87*	0.018	0.14
Help at event	0.077	1.29	0.046	0.58	0.172	1.44	0.045	0.35
Museum	0.032	0.84	0.057	1.12	0.037	0.35	-0.017	-0.27
Ever smoked	0.032	0.77	0.033	0.7	0.125	1.12	-0.012	-0.12
Last week nr cigarettes	0.082	0.28	-0.225	-0.57	0.886	1.07	0.439	0.72
Last week alcohol	-0.010	-0.19	0.058	0.87	*-0.215*	*-1.74*	0.000	
Last week many drinks	0.021	0.16	-0.131	-0.8	0.391	1.36	0.063	0.21
Last month fight	0.017	0.81	0.025	0.69	0.037	1	0.000	
Witness firearms last year	0.077	1.37	0.087	1.19	0.030	0.19	0.073	0.59
Witness phys. Attack last year	0.028	0.47	0.106	1.31	-0.054	-0.43	-0.038	-0.28
Victim discrimination	0.072	1.36	0.039	0.54	0.128	0.95	0.122	1.15
Victim beaten	***0.069***	***2.41***	*0.083*	*1.82*	0.037	1	*0.088*	*1.85*
Victim threatened with arms	0.024	1.07	0.047	1.46	0.000	0	0.022	0.45

Note: Table entries on "Treatment effect" are <u>unadjusted</u> DID estimates of the ATET. The treatment group <u>excludes</u> the "pre-selected" youths. Full sample size is N=325, cohort 1=179, cohort 2=86, cohort 3=60. Significance levels are indicated by italics (10%), boldface (5%), and boldface+italics (1%).

Table A3. Estimated impact of *Galpão Aplauso* on life skills outcomes (z-scores), by post-program elapsed time

Outcomes ((Xi-Xc)/ c)	Full Sample		1-2 months post-program (cohort 1)		2-3 months post-program (cohort 3)		4-5 months post-program (cohort 2)	
	Treatment Effect	t-value	Treatment Effect	t-value	Treatment Effect	t-value	Treatment Effect	t-value
CPS Total	0.101	0.82	0.063	0.38	0.175	0.6	0.035	0.15
CPS 01	0.102	0.77	0.074	0.39	0.080	0.32	0.031	0.12
CPS 02	0.166	1.31	0.179	1.1	-0.160	-0.56	0.107	0.51
CPS 03	-0.065	-0.49	-0.025	-0.14	0.280	0.85	*-0.522*	*-1.95*
CPS 04	0.088	0.61	0.048	0.24	-0.028	-0.08	0.192	0.71
CPS 05	**0.289**	**2.05**	0.152	0.78	*0.556*	*1.66*	0.180	0.68
CPS 06	-0.134	-1.03	-0.133	-0.79	0.114	0.34	-0.028	-0.12
Grit Total	-0.033	-0.27	-0.085	-0.52	0.231	0.86	-0.268	-1.26
Grit Short	0.046	0.37	-0.040	-0.25	0.459	1.51	-0.224	-0.92
Grit 01	**-0.257**	**-2.05**	**-0.349**	**-1.97**	-0.172	-0.67	-0.168	-0.73
Grit 02	0.075	0.61	-0.021	-0.12	0.262	0.96	0.063	0.28
Grit 03	0.106	0.79	0.089	0.49	0.087	0.26	0.017	0.07
Grit Total - Duckworth	-0.090	-0.72	-0.192	-1.12	0.002	0.01	-0.055	-0.27
Grit Short- Duckworth	-0.135	-1.09	-0.247	-1.47	0.172	0.66	-0.290	-1.32
Grit 01 - Duckworth	**-0.268**	**-2.12**	**-0.368**	**-2.07**	-0.198	-0.75	-0.135	-0.55
Grit 02 - Duckworth	0.101	0.77	0.048	0.27	0.164	0.53	0.021	0.1
Grit 03- Duckworth	0.058	0.44	0.105	0.63	*0.560*	*1.66*	**-0.560**	**-2.06**

Note: Table entries on "Treatment effect" are <u>unadjusted</u> DID estimates of the ATET. The treatment group <u>excludes</u> the "pre-selected" youths. Full sample size is N=325, cohort 1=179, cohort 2=86, cohort 3=60. Significance levels are indicated by italics (10%), boldface (5%), and boldface+italics (1%).

Annex 2. Measures of non-cognitive skills

A2.1 The Social and Personal Competencies Scale CPS

The Social and Personal Competencies Scale (*CPS* for its acronym in Spanish – *Escala de Competencias Personales y Sociales*) was developed in 2010 (Brea, 2010, Ibarraran et al., 2012). It was designed to measure the effectiveness of the life skills module of the youth training program *Juventud y Empleo* in the Dominican Republican with respect to the development of positive attitudes and values. For our study the test was translated from Spanish to Portuguese and adapted to the local context, a process involving a group of experts in psychology and language.

The CPS scale measures six basic competencies: i) leadership; ii) behavior in situations of conflict; iii) self-esteem; iv) abilities to relate with others; v) order; and vi) empathy and communication skills. It contains 44 statements to which respondents are asked to answer using a four point (i.e. forced) Likert scale, expressing whether they strongly agree, agree, disagree, or strongly disagree with the specific statement. The responses are used to generate a general score as well as specific scores for each of the six dimensions. A higher score reflects a higher level of development in the social and personal competencies.

A2.2 The Grit Scale

The Grit scale was created in 2007 and later revised in 2009 (Duckworth et al., 2007, Brea, 2010). Grit is defined as "perseverance and passion for long-term goals. Grit entails working strenuously toward challenges, maintaining effort and interest over years despite failure, adversity and plateaus in progress" (Duckworth et al. 2007). The scale, designed for adolescents and adults, measures persistency of effort, enthusiasm about long term goals, consistency of interests, and ambition.

Like the CPS, it is a self-reported test. The respondent rates herself on a series of items using a five point Likert scale where 1 refers to "disagree strongly" and 5 to "agree strongly", i.e. 3 is the neutral option. In the literature, there are several versions of the test ranging from 10 to 17 questions. In this study we used a 13-item scale. It is generally a short test that should take between one to four minutes to answer. Higher scores on the scale are associated with higher levels of motivation and determination over years despite failure or adversity. We also report three subscales: "Grit 01" captures purposefulness, "Grit 02" captures perseverance, and "Grit 03" captures ambition.

According to its inventors, the scale was originally developed to evaluate differences between individuals rather than within-individual changes in behavior over time. Thus, caution is required when the scale is used to assess pre-post changes as a consequence of an intervention.

Annex 3. Single-difference estimates

Table A4. Estimated impact of *Galpão Aplauso* on life skills outcomes (z-scores), by post-program elapsed time

Outcomes ((Xi-Xc)/ c)	Full Sample		1-2 months post-program (cohort 1)		2-3 months post-program (cohort 3)		4-5 months post-program (cohort 2)	
	Treatment Effect	t-value	Treatment Effect	t-value	Treatment Effect	t-value	Treatment Effect	t-value
CPS Total	-0.063	-0.58	-0.095	-0.63	-0.078	-0.26	0.158	0.94
CPS 01	0.029	0.27	0.004	0.03	-0.188	-0.74	0.224	1.09
CPS 02	-0.103	-0.95	-0.101	-0.7	-0.218	-0.66	0.015	0.08
CPS 03	-0.004	-0.04	0.066	0.43	0.006	0.02	-0.118	-0.64
CPS 04	0.054	0.5	0.024	0.16	-0.176	-0.63	0.285	1.55
CPS 05	-0.003	-0.03	0.046	0.3	-0.178	-0.63	0.125	0.69
CPS 06	-0.129	-1.2	-0.241	-1.63	0.283	0.98	0.110	0.65
Grit Total	-0.103	-0.95	-0.100	-0.67	-0.030	-0.11	-0.085	-0.42
Grit Short	-0.015	-0.14	0.051	0.33	0.077	0.33	-0.139	-0.68
Grit 01	**-0.202**	**-1.88**	**-0.341**	**-2.3**	-0.216	-0.78	0.117	0.6
Grit 02	0.012	0.11	0.066	0.44	-0.060	-0.25	0.011	0.05
Grit 03	0.014	0.13	0.142	0.91	-0.137	-0.57	-0.124	-0.63
Grit Total - Duckworth	-0.142	-1.32	-0.185	-1.29	-0.175	-0.61	0.023	0.11
Grit Short- Duckworth	-0.147	-1.37	-0.206	-1.38	-0.036	-0.13	-0.034	-0.17
Grit 01 - Duckworth	**-0.201**	**-1.87**	**-0.340**	**-2.29**	-0.205	-0.77	0.107	0.54
Grit 02 - Duckworth	-0.020	-0.19	0.035	0.24	-0.060	-0.23	-0.056	-0.27
Grit 03- Duckworth	-0.008	-0.07	0.081	0.53	0.255	0.97	-0.284	-1.52

Note: Table entries on "Treatment effect" are unadjusted single differences estimates of the ATET ("raw effects"). Significance levels are indicated by italics (10%), boldface (5%), and boldface+italics (1%).