# Soft Skills Training and Productivity: Evidence from an intervention in retail[*]

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Abstract

This paper examines a training intervention aimed at boosting leadership and communication skills among employees of a large Latin American retailer. The identification argument exploits an experimental design within a difference-in-difference strategy. The empirical analysis is carried out using unique longitudinal information obtained from the firm's administrative records and two specifically designed employee skills surveys. We document large positive effects of the training on store-and worker-level productivity (sales and number of transactions). The intervention was more effective in boosting leadership than communication skills. Spillovers from trained managers to untrained sales representatives contribute to explain estimated effects. Our findings confirm the prospect of increasing productivity through training programs aiming at critical skills.

**Keywords:** Socio-emotional skills, training, productivity, experiments with firms.

**JEL classification:** C93, J24, M53, O15.

## 1. Introduction

The study of the interrelation between human capital accumulation, training and productivity has a long-standing tradition in economics (Becker, 1964). Among workers, on-the-job training is the building block of the human capital accumulation process. In fact, almost half of the human capital individuals accumulate in their lifetime is associated with investments and activities related to work (Heckman, 1998). However, it was not until recently that the empirical economic literature focused on the distinctive role of di□erent skills as key underlying drivers of the human capital accumulation process (Heckman et al., 2006). During the last decades, a growing body of research has documented the essential role of socio-emotional skills - commonly referred to as "soft" skills -as determinants of labor market productivity, both at the individual and aggregate levels (Heckman et al., 2006, Heckman and Kautz, 2012, Daruich, 2018). These include dimensions such as communication, teamwork, and planning and organizing, among others.[1] In this context, new interest has arisen around the economic consequences of on-the-job training programs as, in principle, these can mold labor market outcomes through its impact on the technology of skill formation (Bassanini et al., 2005, Barrett and O'Connell, 2001, Dearden et al., 2006, Konings and Vanormelingen, 2015).

In this paper we quantify the impact of a training intervention intended to modify critical socio-emotional skills – leadership and communication – among workers of one of the largest retailers in Latin America. Through an interactive five-day program, managers from a randomly selected sample of stores participated in activities specifically designed to improve their skills to

[1] Skills have been shown to determine individual-level labor market outcomes, with direct repercussions on productivity, economic growth and other economic dimension, in addition to the well-established effects of skills on economic growth (OECD, 1994, 2015; Hanushek and Woessmann, 2008, 2012; among others), the evidence has documented the impact of skills on learning and multiple academic outcomes, the probability of getting and keeping a job, wages, occupational choices and also a series of social and health behaviors. For example, Heckman et al. (2006); OCDE (2015); Hanushek and Woessmann (2008, 2012); Urzúa (2008); Prada and Urzúa (2017); Almlund et al. (2011); Heckman and Kautz (2012), Heckman and Kautz, (2014a,b); Borghans et al. (2008). For further details on this literature see Roberts et al. (2007) or Borghans et al. (2008).

succeed as team leaders. The program encourages the managers to think about their capabilities and provides techniques to develop new management skills. Likewise, through a two-day program, randomly selected sales associates were trained to develop critical communication skills. The technical content of the sessions includes themes such as complaint handling, advising customers, and understanding the importance of customer service as core to success.

To assess the impact of the intervention, we exploit administrative information provided by the firm, and two skills surveys (baseline and follow up). To secure the identification, we combine the experimental design with a difference-in-difference approach. This hybrid strategy is needed to account for the normal operation of the business, which includes high rotation of employees and strategic re-allocation of workers across locations. We quantify the effect of the training on direct measures of productivity both at the store-and individual-level. Moreover, in order to shed light on the economic mechanisms, we investigate the extent to which our findings are explained by changes in leadership and communication skills.

Our main results can be summarized as follows. We document positive and significant effects of the training intervention on store-level productivity, as well as on worker-level labor productivity, measured by sales and number of transactions. We also find evidence supporting the hypothesis that the training boosted leadership and management skills among store managers. However, we could not uncover any impact of the training on measured communication skills among salespersons.

The contribution of our analysis to the literature is three-fold. First, given the experimental design, we use the exogenous variation in training participation to identify the effect of training in the context of a private firm. We also shed light on to whom the training should be directed to within a company (managers, sales associates or both groups), and the differential impact associated with that decision. Second, rather than analyzing programs offering training in several dimensions of skills, we estimate the impact of a program aimed at boosting two socio-emotional dimensions. This allows us to narrow down the mechanisms explaining the estimated effects of the intervention. Third, we assess the causal impact of training on direct productivity measures (sales and transactions). Despite the long-standing literature analyzing the impact of on-the-job training, to the best of our knowledge, ours is the first paper providing direct evidence on these dimensions.

Like any other empirical study exploiting experimental variation, our findings cannot be directly extended to other settings (Deaton and Cartwright, 2018). Nonetheless, the analysis provides useful insights for policy making as our findings not only show how a tailored made on-the-job training program can increase the stock of skills during adulthood but also confirm it is possible to improve labor market outcomes by targeting malleable skills. In addition, our analysis highlights the importance of private sector involvement in the design of skill-oriented interventions. Thus, beyond our main results, this study also throws lessons about the characteristics of effective training programs. These might be particularly relevant for developing countries, where labor productivity growth is sluggish and significant public resources are allocated to extemporaneous training programs.

The paper is structured as follows. Section 2 summarizes the literature. Section 3 describes the intervention. Section 4 describes the identification strategy. Section 5 presents the data sources used and exploratory results. Section 6 presents the main results. Section 7 concludes.

## 2. Literature Review

The identification of the causal impact of skills training programs on productivity represents an industrious and challenging task (Heckman et al., 1999). First, the non-random selection of workers into the training prevents the direct estimation of causal effects, as these cannot be unraveled from other factors that might also be associated with both individual productivity and participation in the training program. Second, constructing good proxies for workers' productivity is rather difficult. While wages are often used to estimate returns to training, these may not capture the overall impact of participation on productivity (Dearden et al., 2006).[2] Third, training programs are heterogeneous: they vary greatly in terms of quality, type, purpose, intensity and objective. As a result, to a large extent, the existing evidence on the impact of training is mixed (Kluve, 2016, Urzúa and Puentes, 2010, Mitnik et al., 2016, Bassanini et al., 2005, Ibarrarán et al., 2015). This prevents the identification of effective mechanisms to increase worker's labor market productivity, which in turn leads to inadequate guidance for policymaking.

Our paper contributes to the literature in the three aforementioned areas. It uses exogenous variation in training participation to identify its causal impact. In addition, it exploits rich longitudinal data to construct direct productivity measures. And, since the intervention was designed to modify two specific skills, it narrows down the main mechanisms behind any estimated effect.

Despite the long-standing literature on the impact of training programs, only a handful of studies are closely related to ours. De Grip and Sauermann (2011) and Adhvaryu et al. (2018) quantify the impact of on-the-job training on direct measures of productivity, using an experimental design. Both papers do this in the context of a private firm. Specifically, De Grip and Sauermann (2011) assess a task-specific intervention combining formal coaching addressing tips to improve productivity and learning by doing. They find that participation in a 38-hour program leads to a 9 percent increase in productivity. The paper also presents evidence of exter-

[2] Conti (2005), Dearden et al. (2006), Almeida and Carneiro (2009), Konings and Vanormelingen (2015) use individual-level productivity measures as the outcomes of interest and Barrett and O'Connell (2001) examines sales. See González-Velosa et al. (2016) for estimates in the context of Latin American countries.

nalities from treated workers on their untreated peers. In particular, an increase of 10 percentage points in the share of treated peers leads to a productivity increase of 0.45 percent.[3] By focusing on a training program targeting two socio-emotional skills, which can be conceptualized as more general in nature than a task-specific intervention, our analysis complements the results from this study.

More recently, Adhvaryu et al. (2018) evaluate the impact of soft skills training on workplace outcomes among female garment workers in India. [4] The training targeted a wide range of skills including communication, problem solving, hygiene, and reproductive health, among others.[5] Based on an experimental design, the authors report a 12 percent increase in productivity, a 0.5 percent increase in wages after program completion, and a large net return to on-the-job soft skills training (250 percent 9 months after program completion). Our results are in line with these findings. However, since we mainly focus on only two dimensions of soft skills, we can narrow down the mechanisms explaining the estimated e□ects of training. In fact, neither De Grip and Sauermann (2011) nor Adhvaryu et al. (2018) document the direct impact of training on the targeted skill dimensions.[6]

Our paper also speaks to the strand of the literature analyzing spillovers arising from the human capital accumulation process. The experimental design in Adhvaryu et al. (2018) allows

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[3] The experiment analyzed was implemented in an in-house call center of a multinational mobile network operator in the Netherlands. The training consisted of a discussion with a coach on the skills needed to improve productivity –i.e., reduce the time an agent needs to handle a customer call- how these skills could be improved and practical tips. The training combined formal conversations with learning by doing.

[4] [4]The paper focuses on the number of pieces (garments) produced and the efficiency of the production process. Efficiency is calculated as the number of pieces produced divided by the target quantity of pieces per unit of time and, alternatively, as the Standard Allowable Minute (SAM). SAM is defined as the number of minutes that should be required for a single garment of a particular style to be produced.

[5] The paper investigates the Personal Advancement and Career Enhancement (P.A.C.E.) program. It was designed and first implemented by GAP Inc. The program consists in an 80-hour training focused on improving life skills such as time management, effective communication, problem-solving, and financial literacy for its trainees. It also included additional modules on Water, Sanitation and Hygiene and General and Reproductive Health

[6] Adhvaryu et al. (2018) only use survey responses to support the hypothesis that the program increased the stock of soft skills in the month after program completion.

for spillovers to untreated workers within the five garment factories in Bengaluru (India), both through the transfer of skills as well as through production complementarities. Likewise, De Grip and Sauermann (2011) reports experimental evidence for general externalities from treated workers to their untreated teammates. However, these studies do not analyze spillovers across job titles (e.g., from managers to sales associates and vice-versa). In this way, we shed light on to whom the training should be directed to within a company (supervisors, employees or both), and estimate the differential impacts from that decision. Thus, our findings are related to the recent evidence on the effectiveness of management practices (Gosnell et al., 2019).

Finally, our paper connects to the research highlighting the importance of examining skills at a granular level (Kern et al., 2013) as this, among other things, allows the interrelationships across dimensions to be uncovered (Borghans et al., 2008, Cunha et al., 2006). For instance, using data from the United States, Prada and Urzúa (2017) document how manual and mechanical skills, which can be conceptualized as cognitive dimensions, have distinct effects on labor market outcomes relative to those previously documented using more conventional facets. This also links to the recent findings on the role of routine and non-routine tasks in changing labor markets (Acemoglu and Autor, 2011). By investigating the potential complementarity between different soft-skills in the context of a training program we contribute to these previous efforts.

## 3. A skill-oriented intervention

The training intervention was designed to enhance two critical skills: leadership and communication. It was offered to the employees of a major retail firm in Latin America, which has a large market share in the footwear, clothing and accessories sector in Chile. Its business consists of importing, advertising and distributing products from international and domestic brands.[7] The cornerstones of the company are the strength of its brands, the high quality of the products, and the customer service provided to the client.

Firm's sales operations are conducted primarily in large shopping centers (malls) and, more recently, in small outlet malls. By 2014, the firm had 324 stores located throughout the country. Each store has one manager who oversees the operations, coordinates and supervises the work of the sales associates and other employees, and reports directly to the coordinating manager of all the stores in each brand (chain manager). Almost 78% of the firm's employees work in the stores as sales associates.

**The design of the training program.** In contrast to most of the existing literature, the training program examined herein was designed to address specific skill needs within an organization. To identify these critical dimensions, we first implement an ex-ante assessment of the training needs of the firm and identify major skill gaps among its employees.

The training needs assessment was conducted using multiple activities, including (i) interviews and focus groups with the business executives to assess the future of the business and the skills that employees need to meet the company's expectations; (ii) focus groups with 12 store managers to identify the skills needed to increase productivity within each location, and the methods considered most effective and convenient to address the identified skill gaps; (iii) interviews with managers and sales associates at 14 stores to evaluate how staff perceived the business needs as well as the skills they require; (iv) the collection and analysis of a skill survey designed to capture self-assessed current and future skills needs, and preferred learning methods; and (v) 360-degree reviews with a selected group of 16 managers, their supervisors (chain

[7] The company has a large portfolio of trademarks to cover the different segments of the footwear and clothing market. In 2015, it managed 15 consolidated brands.

managers), and their staff (sales associates). These provided an in depth understanding of skill levels within the firm.

From these exercises, three major training needs emerged: (i) coaching and leadership skills for managers, including building team confidence and good teams, dealing with different personalities and learning styles; (ii) selling and communication skills, building confidence in communication, and frustration and conflict management; and (iii) technical training such as brand knowledge and specifications. Thus, after considering the internal knowledge of the production function of the firm, we singled out communication and leadership as the two critical skills to be targeted by the intervention.

To incorporate the large differences between the type of activities and tasks performed by store managers and sales associates, we designed a training subprogram for each job profile. The training intervention was designed by one of the leading skills and workforce development organizations in the UK.[8] Each training subprogram included: (i) the design of a curriculum (training content) aligned with the assessed needs, and (ii) the design of a structured plan to ensure high-quality in the delivery of the training, which included a careful selection of master trainers, extensive training for master trainers to ensure homogeneous training experiences to all employees, and close monitoring of the progress of both the master trainer and the employees receiving the training.

**Training store managers**. Through an interactive five-day training, managers learned key confidence building skills to succeed as leaders, focusing on developing individual leadership skills to exploit the human capital potential of sales associates and, to maintain satisfied and productive teams. The program encourages the managers to think about their own management

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[8] People 1st is an organization with more than 50 years of experience designing and implementing training strategies for the retail, hospitality, travel, tourism and passenger transport industries.

skills and develop new management techniques. An important component of the program was its interactive and dynamic nature, which explains why a large fraction of the training was devoted to practical activities using concrete examples and promoting active participation supplemented with supervised practice of what has been learned. The course was organized in modules offered in 7-hour sessions, for a total of 30 hours of training.[9]

**The sales personnel program.** Through an interactive two-day training, store employees learned central communication skills in the context of their daily tasks and specific technical content in areas such as complaint handling, understanding their product to advise customers, technical knowledge on specific detail of the products, and understanding the importance of customer service as core to success. Thus, this training module aimed to develop effective communication skills to improve sales strategies, to communicate better with clients and to enhance internal communication with other members of the store. The program encourages collaborative strategies using real-life experiences of good and bad service and promoting the understanding of the factors influencing customers' choices. The course was organized in twelve 60-minute modules.[10]

**Quality assurance**. As the economic literature shows, high-quality trainers (e.g., teachers) are essential to ensure a high-quality learning experience with long-lasting effects (Chetty et al., 2014). This principle explains the important role of the "Master trainers" program, one of the components of the intervention.

The main objective of the "Master Trainers" program was to train the individuals in charge of delivering both the store manager and team training programs. To this end, a group of senior managers was carefully selected by the firm. Selected managers had to be perceived by their

[9] Table A1 in the Web Appendix presents a detailed description of the content of the training each day.
[10] Table A2 in the Web Appendix displays a detailed description of the modules.

supervisors as suitable persons to train the trainers, particularly recognized for their exceptional leadership qualities and high motivation. Their training consisted of special sessions delivered by a senior Spanish-speaking Master trainer from People1st. Overall, eight employees became fully qualified trainers for the management training and seven for the salespersons training.

Another important component to ensure the quality of the intervention was the full involvement of the firm, with the exception, of course, of any decision or action leading to the selection and assignment of stores to treatment and control groups. This strategy aligned the intervention's activities with the firm's capacity to sustain and build on training over time. Given its organizational and learning culture, this helped to guarantee that employers knew why they were being trained for and what the expectations of their supervisors would be.[11]

**Training schedule.** To avoid a□ecting the normal operation of the stores, the training for the managers was distributed over a period of 5 weeks (1 day per week), between the fourth week of May and the fourth of June 2016. The training for the sales team took place in two consecutive days during the month of August.

## 4. Identification Strategy

Our identification strategy exploits a random assignment of treatment to stores as well as detailed longitudinal information on workers. The experimental design is at the core of our identification strategy as it defines treatment and control groups, while rich longitudinal data allows us to control for noncompliance arising from the normal operation of the firm. We begin by describing the treatment assignment.

**Sampling Frame.** Our sampling frame used as input the list of all stores reported by the firm as

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[11] It is worth mentioning that store managers and sales associates completed learning assessments at the end of each training day. Only those who attended all sessions, completed the practical exercises and the learning assessments, received a certificate as proof of a successful participation. In practice, only the attendance condition was binding, because all the participants with full attendance completed the practical exercises and fulfilled the learning standards.

of October 2015. We selected those located in the largest municipalities from the three largest regions of Chile: Viña del Mar and Valparaíso in region V; Talcahuano and Concepción in region VIII and Santiago in Metropolitan Region-RM. We selected these municipalities for three reasons. First, they contain 60% of the operating stores in the country.[12] Second, overall these three regions represent a large proportion of the country's economic activity (57% of Chile's GDP in 2015). Third, given the geographic proximity, the stores in these regions/municipalities offered practical advantages given the intervention's budget. See Table 1 for details.

[[Table 1 near here]]

In addition, we consider all stores located outside of a shopping mall to be ineligible for inclusion in the experiment. This decision was made after identifying critical differences between units located inside or outside shopping centers (traffic of potential clients, security provisions, hours of operation, total sales, knowledge and merchandise transfer between stores, etc.). This left us with a total of 157 potential stores to be considered for the intervention.

Finally, to secure the existence of a large number of comparable treatment and control units, we removed those stores located in shopping malls with less than three stores. The 157 stores were operating in 34 shopping malls but only 22 shopping malls have 3 or more stores. Thus, after applying the three restrictions on the sample -i.e., geographical location, shopping mall location and shopping mall size -we ended up with 138 stores eligible for the intervention. These stores represent nearly 43% of all the stores nationwide, 76% of the units located in the selected municipalities and 90% of the annual sales in 2014.

**Randomization process.** The randomization process involved allocating stores into three

[12] Out of the 324 stores throughout the country, 222 were in the three regions included in the experiment, and 194 in the five largest cities within these regions.

different categories: the control and two treatment groups. For the stores randomly assigned to the first treatment group (T1), their managers received the training program focused on leadership, management and coaching skills. For the second group (T2), both manager and sales associates received training. While the former received the manager training, sales associates received the training program focused on communications and sales. In the last group (control C), neither managers nor staff were trained.

We exploited the characteristics of the sample and stratified by shopping mall. This means that in each of the 22 malls, we randomly select stores into one of three groups. To maximize the statistical power of the intervention with multiple treatment groups, we set the number of stores in the control group to be the largest of all categories.[13] Table 2 presents the distribution of the selected 138 stores across the three groups -T1, T2 and C- and label them as the ”intended treatment groups”. The Table also identifies the “final treatment groups”, the final outcome after taking into account imperfect compliance.

[[Table 2 near here]]

**Securing identification without full compliance**. Out of the 82 managers in the stores assigned into the initial treatment groups, 71 ended up attending the training sessions. Among sales associates the final number was 176 (out of the original 179).[14] The differences between the initial and actual numbers are explained by the company's normal turnover, licenses and other activities. In addition, given the nature of the business and the impossibility to interfere with

[13] This decision was made to minimize the sum of the minimum detectable effect for the two treatments. See Bloom (1995) and Duflo et al. (2006) for more detail.

[14] In the case of the stores initially assigned to T1, 9 ended up with untrained managers because they were not able to attend the training, moved to a different store or left the company. These stores were reclassified into the control group. In 14 of the stores initially assigned to T2, the managers could not complete the training, 13 stores were classified in a new group for stores where only the staff received training, the other store was reclassified as T1 because the manager was able to receive training with the team from Santiago. Finally, from the 53 stores assigned to the control group, three were reclassified as T1 because a trained manager moved to the stores. These changes are reflected in Table 2.

firm's strategy decisions, after the initial random assignment few managers moved to different locations. Since the firm was not aware of the initial assignment, these decisions were exogenous to the intervention. However, reallocation and new hires implied that some of the stores originally assigned to the full intervention group (T2) ended up with a new and untrained manager. Instead of discarding these cases, we took advantage of them. We made use of these exogenous events to define a new intervention group, (T3), composed by stores where only sales associates (sellers) received training.

Table 2 describes the final structure of our sample. It compares the number of stores in the initial treatment assignment with the stores in the final treatment groups, while Table 3 compares the number of employees to be trained -managers and sales associates-following the initial treatment assignment with the number of employees that actually received and completed the training.

[[Table 3 near here]]

Given the nature of the intervention, forcing the firm to put on hold the regular re-allocation of managers and other personnel across stores would have compromised its participation. Thus, despite the efforts to secure the random allocation of training across stores, firm's decision could affect the full compliance of the intervention. To further shield our identification arguments from threats emerging from firm's strategic behavior, we complement the experimental design with quasi-experimental methods. As described below, given the potential consequences of firm's decisions regarding the pre-and post-treatment assignment of workers across treated and control stores, we exploit the rich store-and individual-level longitudinal information, the timing of the intervention, and the treatment/control status to implement a

Di□erence-in-Di□erence strategy (DD).[15]

## 5. Data and Exploratory Results

Our empirical analysis uses three sources of information: store and employee-level records provided by the firm, including daily sales and number of transactions; and two skill surveys (baseline and follow up) characterizing employees' cognitive and socio-emotional abilities as well as their socio-economic background.[16]

**Firm's records.** The firm's records include (i) daily sales from all transactions for the period January 2014 -November 2016 for all 324 locations, including employee's identifiers for 8,553 individuals who worked at the firm at least one day during the period; ii) worker-level monthly earnings from January 2014 to September 2016, including positions, promotions, tenure at the company (and specific location), sales commission and other demographic variables (age and gender); and iii) general information about stores, including geographical location (region and municipality), size (square meters and number of workers) and whether or not it is located at a shopping center. Figure 1 illustrates the richness of this data. Its panel (a) displays total daily store sales for the period 2014-2106. As expected, sales (and the non-displayed number of transactions) follow a clear cyclical pattern, with significant increases on specific dates (e.g., Mother's Day and Christmas). Our empirical strategy takes these recurring cycles into account. Panel B highlights how the longitudinal employee-level information allows us to characterize individuals' progression within the firm. For a given individual, we identify her job position,

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[15] Table A3 in the Web Appendix explores the potential consequences of these managerial decisions. It presents baseline balance checks for a set of relevant variables and two different time periods. The new treatment group (*T3*) does not display differences in pre-treatment variables relative to the others as, in general, we fail to reject that mean differences across groups are statistically different from zero (an exception is the dummy variable "Region XIII" (RM), which our empirical analysis takes into account). However, we recognize the number of stores in *T3* is smaller than those in *T1* and *T2*. This fact may limit our chances to detect small size effects. Web Appendix A. describes and presents formal tests for parallel trends. As its figures show, regardless of the treatment group, the assumption of parallel trends cannot be rejected.

[16] The information on sales and transactions is recorded in real time, but we use daily aggregates to reduce the noise created by the natural dynamics of a day in a store.

earnings, and sales commissions since she was hired.

[[Figure 1 near here]]

Table 4 presents summary statistics for the variables of interest by treatment status between 2014 and 2016. The outcomes include total daily store sales, daily sales per worker, daily sales per transactions, total daily transactions and daily transactions per worker. Average daily sales range between $1.1 million and $1.4 million Chilean pesos (CLP) (between 1,800 and 2,300 US dollars) with daily transitions reaching approximately 8 per day per worker. The average number of workers per store is 7 across control and treatment groups. The variable "variety" is a store-level indicator of the degree of specialization, while "Brand" and "Brand-Short" identify the main brands sold at each location.[17]

[[Table 4 near here]]

**Skill Surveys and individual-level information**. We conducted two surveys to characterize the skills of all managers and sales associates working for the retail company. We use a website specially designed for this purpose. The first round (baseline survey) gathered information for 1,661 workers during November and December of 2015. The second round (follow up) gathered information on 1,569 workers collected over the months of November and December of 2016 with few responses in early January of 2017. Given the high mobility of workers across stores within the firm, we count with information on cognitive and socio-emotional skills for 2,445 individuals. From those, 781 workers reported skills in both surveys.

The battery of socio-emotional tests includes communication and leadership skills as well as meta-cognitive strategies (planning activities and critical thinking), self-e□cacy (self-perception

[17] The variable "variety" records how many product categories are sold at the store, where the categories are: footwear, clothing, accessories and others. "Brand" takes a different value for each of the 15 brands the firm owns. "Brand short" groups the 15 brands into four categories depending on the average sale price per item.

of ability to organize and achieve goals), grit and the five big characteristics of the "Big Five" personality traits (openness to experience, conscientiousness, extraversion, agreeableness, and neuroticism). Information on cognitive skills included Raven's Progressive Matrices, reading comprehension, and mathematical knowledge. Additionally, the surveys gather demographic information (age, gender, schooling level, parental education, and other socio-economic characteristics) and variables describing the past experience at the company as well as expectations about the future. Table 5 presents summary statistics for the different skills from the two surveys (Panels A and B) as well as variables of interests extracted from the company's records (Panel C). This last panel includes all employees working for the firm with recorded sales during the period 2014 and 2016.[18]

[[Table 5 near here]]

Although the skill measures are standardized within the overall sample (mean of zero and standard deviation of one), we document differences between managers and sales associates at baseline. As presented in Figure 2, managers report higher scores than sales associates in all skill measurements except for extraversion, with statistically significant differences for communication, self-efficacy, openness to experience and agreeableness. Our empirical analysis takes this fact into account as we analyze the differential effect of the intervention by group.

[[Figure 2 near here]]

By combining firm's records and individual responses to the surveys we can first examine the empirical association between different skill dimensions and individual-level outcomes of interest. We link leadership and communication to the probability of promotions within the firm

[18] Table A5 in the Web Appendix presents the summary statistics for the final sample of individuals used in our regression models. See Section 6.2.

(from sales to store management) and the average sales per transaction (December 2015).[19]

We use the first round of the skill survey to assess the importance of leadership and communication skills. Figure 3 displays the contour plot for the association between leadership and communication skills and total sales in 2014 for sales associates (Panel a) and managers (Panel b), respectively. In general, higher levels of both skills are associated with more sales, confirming the conclusions drawn from the original training needs assessment. However, di□erent patterns appear for workers depending on their roles in the firm. In the case of sales associates, higher sales are present for individuals with high levels of both skills dimensions. However, the combination of high communication and low levels of leadership also correlates with high sales levels. In contrast, for managers the combination of high levels of leadership with relatively low scores in communication is correlated with the largest values of total sales in 2014.

[[Figure 3 near here]]

Tables 6 and 7 explore these associations in further detail. The first one displays the results of a Probit model of promotions (by December of 2015) on the set of individual characteristics. Regardless of the specification, we estimate that one standard deviation increases in "leadership" at baseline increases the probability of promotion to store manager between 15 and 20 percentage points. This represents a sizable magnitude, as the average probability of

[19] [20]The leadership and communication variables represent standardized versions (mean zero and variance one) of the averages generated from two modules of the Social and Personal Competencies Scale (CPS for its Spanish acronym "Escala de Competencias Personales y Sociales"). The CPS is a non-cognitive test that measures the effectiveness of life skills in developing positive attitudes and values. The test measures six basic competencies: leadership, empathy and communication skills, behavior in situations of conflict, self-esteem and abilities to relate with others. Our analysis exploits the first two dimensions. The scale was developed to evaluate the life skills training component of a training program in the Dominican Republic. See for example, Ibarrarán et al. (2009), Ibarrarán et al. (2014), Ibarrarán et al. (2015). Refer to Prada and Rucci (2016) for more details on the CPS.

promotion within the sample is only 2.6%.[20] Table 7, on the other hand, presents the results of a regression of average sales on individual's characteristics. These findings confirm a significant and positive correlation between communication and sales per transaction. The results are robust to di□erent specifications.

[[Table 6 near here]]
[[Table 7 near here]]

Thus, while the intervention's emphasis on leadership and communication was a direct result of a qualitative analysis, it is interesting to confirm their correlation with productivity (sales) and career progression (promotion).[21]

## 6 Main Results

### 6.1 Store-level analysis

Since the intervention was carried out at the store-level, we first present store-level results.

As previously stated, our experimental design of the intervention should lead to the direct identification and estimation of its impacts. However, as a result of the natural adjustments made by the firm (e.g., hiring and firing decisions, transfers and store closures), we implement a Di□erence-in-Di□erence strategy (DD), exploiting the availability of rich longitudinal data and the random assignment of treatment. Formally, we estimate the following regression model:

$$Y_{j,t} = \beta_0 + \beta_1 D_j + \beta_2 B_t + \beta_3 D_j B_t + \beta_4 X_j + \beta_5 g_t + e_{j,t} \, , \qquad (1)$$

where $Y_{j,t}$ represents the outcome of interest of store $j$ (e.g., sales) in period $t$, $D_j$ is a binary indicator taking a value of one if store $j$ was treated and equals to zero if belonged to the control

[20] It is important to clarify that the results of the skill measurements are confidential and were not shared with the executives of the company. Therefore, promotion decisions could not have been influenced by these tests.
[21] To a large extent, promotions within the organization are based on individual productivity measures, e.g., total sales.

group, $B_t$ defines the period (before or after the training program), $X_j$ is a vector of store-level controls measured at baseline (e.g., geographical location, type of products, number of employees, etc.), $g_t$ is a set of time controls (year-week fixed-effects and weekend dummies), and $e_{j,t}$ is the error term. The parameter of interest is $\beta_3$.

A central feature of the intervention is the existence of three different treatment groups: stores where only managers were trained (*T1*), both managers and salespeople were trained (*T2*) and only salespeople were trained (*T3*). Therefore, given the nature of the intervention, we focus on the differences between each of these groups relative to the untreated stores. To this end, we estimate separate regressions for each treatment (*T1, T2, T3*) and define $D_j$ accordingly.

With respect to the post-treatment period, for the manager intervention (*T1*) we use the first 147 days after the end of the training, whereas for sales associates (*T2* and *T3*) we consider the first 77 days of post-treatment data. In addition, given that we only have post-treatment information for the weeks 25-46 of 2016, we estimate equation (1) restricting the sample to the same weeks in the pre-treatment years (2014 and 2015). In this way, we secure the comparability of our outcomes, avoiding the seasonal patterns characterizing the first weeks of the year.[22] We interpret our point estimates as the short-term effects (as of November 16, 2016).

Additionally, for stores in which both the manager and sales associates received training (*T2*), we exploit the timing of the intervention to investigate potential synergies emerging from the program. More precisely, within those stores, we use the longitudinal data to assess the impact of the training in two different post-treatment periods: after the manager has been trained but the sales team has not, and after all employees (sales associates and manager) have

[22] As shown in panel (a) of Figure 2, the evolution of weakly sales is characterized by clear seasonal patterns. Mother's Day in May and Christmas season generate changes in the dependent variable that cannot be captured by the post-treatment data. In consequence, we restrict the sample to consider the cyclical behavior of sales in the empirical estimation.

gone through the training program.[23]

Let $B^1{}_j$ be a dummy variable capturing the period in which only the store manager has been treated ($B^1$ = 1 if post-treatment, and 0 otherwise). Likewise, let $B^2{}_j$ be a dummy variable identifying the period after all store *j*'s employees have been trained. Thus, we extend equation (1) and estimate the following regression models for the analysis of the impact of *T2*:

$$Y_{j,t} = \alpha_0 + \alpha_1 D_j + \alpha_2 B^k{}_j + \alpha_3 D_j\ B^k{}_j + \alpha_4 X_j + \alpha_5 g_t + u_{j,t}\ , \qquad (2)$$

where $k = \{1,2\}$, $u_{j,t}$ is the error term and $\alpha_3$ is the parameter of interest. In this case, the identification strategy remains the same as in model (1).

**Findings.** We investigate the impact of the training program on two outcomes of interest: total daily sales and total transactions per day.

In our sample, store-level average daily sales are approximately 1.1 million CLP (1,630 dollars). Table 8 presents the results for this outcome variable. The set of regressions include controls for time (year and week) and mall fixed-e□ects as well as for number of employees, number products sold at the store, weekend dummies, and region dummies.

[[Table 8 near here]]

The figures under Column (1) indicate that, on average, the stores where only store managers received training (*T1*) increased daily sales by 119 thousand Chilean pesos (176 dollars)[24] compared with the stores in the control group. The intervention on both sales associates and managers (*T2*) also displays positive e□ects. When restricting the sample to the period in which only store managers had received the training (Column (2)), the estimated impact of the inter-

[23] Thus, in the first case, we estimate the effect of a trained manager during the days between the end of the manager's training (June 22nd) and the beginning of the team training (August 1st). In the second case, we are estimating the effect during the days covering the period after the team's training completion (approximately August 31st), and the end of the period of analysis (November 16,2016).
[24] 675 CLP = 1 US dollar

vention is 110 thousand pesos. Column (3) presents the results for the post-treatment period when both managers and sales associates in *T2* stores had been treated. Here daily sales increase by 138 thousand pesos, equivalent to 204 dollars or 12.1% of average daily sales at the store-level. The comparison of columns (2) and (3) suggests the existence of spillovers between manager and sales associates within the stores. We explore this below. The intervention on only sales associates (*T3* or column 4) raise sales in 9 thousand pesos (13 dollars), but this e□ect is not statistically di□erent from zero.[25]

Overall, these findings indicate that the largest gains in productivity, proxied by daily store-level sales, emerge among stores where salespeople and store managers were trained. We obtain similar results if we estimate the model using the complete sample (all months in the pre-treatment period). Those results are presented in Table A6 in the Web Appendix.

The training intervention could have boosted sales by either fostering the teams' capacity to sell more expensive products (intensive margin), by increasing the number of total transactions (extensive margin), or by a combination of these two channels. To shed light on this matter, Table 9 displays the results obtained from the DD model using the number of daily transactions at the store level as the outcome variable. Our findings show overall positive impacts but highlight the di□erent mechanisms driving the increase in sales depending who receives training in the store.

[[Table 9 near here]]

As above, Column (1) presents the results when T 1 stores are compared to those in the control group. The large estimated e□ect implies that the training of only the store managers increased the number of transactions in approximately 6 events per day, a 11% increase over the

[25] Similar results were obtained using the information aggregated at lower frequency-weeks, months, year-.

average daily transactions observed during the period. Interestingly, the estimates for the stores where sale associates and manager received training (columns 2 and 3) are considerably smaller and only significant at 10%. Interestingly, although less clear than in Table 8, these findings also suggest the presence of spillovers between employees within the stores. When it comes to T 3 (Column D), we document a small positive effect of the intervention. However, the estimated value is not statistically different from zero.[26]

**6.2 Individual-level analysis**

Despite the fact that ours is a store-based intervention, we can exploit the rich individual data to assess the impact of training on store managers and sales personnel. To do this, we estimate versions of equation (1) but using individual-level information instead of store-level data. In particular, we estimate:

$$Y_{i,t} = \beta_0 + \beta_1 D_i + \beta_2 B_t + \beta_3 D_i B_t + \beta_4 X_i + \beta_5 g_t + e_{i,t}\ , \qquad (3)$$

where we use the sub-index $i$ to denote individuals. The definition of the variables follows from our store-level model, thus $Y_{i,t}$ represents the outcome of interest of individual $i$ in period $t$, $D_i$ is a binary indicator taking a value of one if individual $i$ received training and equals to zero if belonged to the control group, $B_t$ defines the period (before or after training), $X_i$ is a vector of individual-level controls measured at baseline (e.g., age and gender) including region fixed-effects, $g_t$ is a set of time controls (month and year fixed-effects), and $e_{i,t}$ is the error term. The parameter of interest is again $\beta_3$. The identification of this parameter is based on the comparison of individuals assigned to treatment stores who participated in the training and individuals assigned to control stores, before and after the training program.

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[26] Table A7 in the Web Appendix presents the results for the whole sample (expanding the sample to all weeks). These findings are similar in magnitude but less precisely estimated, suggesting the importance of excluding seasonal patterns characterizing the first weeks of the year. All in all, our results indicate positive effects of training on daily transactions, particularly for treatment groups *T1* and *T2*.

Moreover, to provide a precise idea of the e□ect of the intervention, particularly the potential impact of communication skills among sales personnel and leadership among store managers, equation (3) is estimated using three di□erent samples: overall (pooled sample of sales personnel and store managers), only sales personnel and only store managers. On the other hand, since the timing of the intervention varies across individuals, we adjust the definition of $B_t$ accordingly. In particular, for the results obtained from the pooled regression we use the most restrictive definition (pre-treatment ends before the starting date for the managers training and post-treatment starts when sales personnel training ends). Finally, we follow our store-level analysis and restrict the individual data to match the same months in post-and pre-treatment periods (between mid-June and the end of November).[27]

**Findings.** We first present results using monthly sales as the dependent variable. These are displayed in Table 10. In the pooled regression (Column (1)), the estimated e□ect of training is 920,000 CLP (approximately 1,400 dollars). For sales associates (Column (2)) and managers (Column (3)), monthly sales increased by 810,000 CLP and 900,000 CLP, respectively. These results are aligned with our store-level findings. The intervention led to significant growth in sales across groups.

[[Table 10 near here]]

We next assess whether the previous findings are driven by changes at the extensive margin. To this end, Table 11 displays the results using individual's total number of transactions per month as the dependent variable. Column (1) displays the results for the sample of all employees. We find that, on average, the training program increased the number of transactions per worker in 40 events per month. The result is statistically significant at 5%. Columns (2) and

[27] The results using data for the whole period are presented in Tables A8 and A9 in the Web Appendix. By comparing these results we can assess the robustness of our findings to pre-treatment trends and seasonality not captured by $g_t$.

(3) report the effects for sales associates and managers, respectively. For the former, the estimated effect is more than 50 extra transactions per month, whereas for the later the impact is less than 20 transactions per month and non-statistically different from zero. These findings indicate the main impact came from the sales associates.

[[Table 11 near here]]

**6.3 Spillovers**

As described above, the experimental approach secured the random assignment of training to stores, but it did not limit the company's capacity to re-allocate employees across stores.[28] As a result, individuals who were originally assigned to stores with an untrained manager (e.g., *T3* stores) could unexpectedly end up with a trained one. We exploit this phenomenon to investigate the presence of spillovers from trained managers/supervisors to untrained sales personnel. Formally, we estimate:

$$Y_{i,j,t} = \gamma_0 + \gamma_1 S_{i,t} + \gamma_2 B_t + \gamma_3 S_{i,t} B_t + \theta_i + \theta_j + u_{i,j,t}\,, \tag{4}$$

where $Y_{i,j,t}$ is the outcome of interest of individual $i$ in store $j$ in period $t$, $\theta_i$ is an individual fixed-effect, $\theta_j$ is a baseline store fixed-effect and $S_{i,t}$ is a binary indicator taking a value of one if individual $i$ in period $t$ was untrained and assigned to store $j$ with a trained manager and equals to zero if belonged to a store in the control group, $B_t$ defines the period (before or after the training of managers), $u_{i,j,}$ is the error term and $\gamma_3$ is the parameter of interest.

The presence of individual and store fixed-effects represents a major difference between (4) and our previous regression models. In this case, $\theta_i$ and $\theta_j$ control for the potential strategic re-allocation of workers across stores, isolating the impact of the intervention on untrained

[28] The intervention was designed to modify the skill levels of those working at treated stores by October of 2015. However, after the original treatment assignment the firm was free to re-assign managers and sales personnel across stores.

individuals. Therefore, one should use caution when comparing point estimates across equations as the source of identification depends on the sample and specification. In fact, while equation (4) exploits store switchers to identify the parameter of interest, our previous findings took advantage of the timing of the intervention and the treatment status of all individuals.[29]

Table 12 presents our results. For sales (column (1)) and number of transactions (column (2)), we document positive and significant e□ects. Despite the fact the sources of identification di□er across specifications, the magnitudes of these point estimates are similar to those reported in Tables 10 and 11. Consistent with our previous findings, positive spillovers from managers to sales personnel emerge as a driver of our results. Columns (3) and (4) repeat the analysis using only store. The results are similar in magnitude although less precise.

[[Table 12 near here]]

**6.4 Exploring Potential Mechanisms**

Our findings suggest the training intervention increased treated units' productivity levels. However, they are silent about the specific mechanisms triggering the gains. For instance, rising total sales and/or transactions among "treated" store managers could have been the direct result of their improved leadership skills, but also the indirect consequence of higher levels of communication skills among the "treated" sales personnel working at the same stores. Likewise, increasing sales and transactions among sales personnel could have been the direct result of higher levels of communication skills within this group, but also the indirect consequence of higher levels of leadership among "treated" managers. Thus, two critical questions remain: Did the intervention modify skills? And if so, what skills?

[29] Within the sample of untrained store associates, store-and individual-level fixed-effects can be added to the regression because treatment status can change over time. In fact, 63% of untrained sales associates worked at some point in a store with an untrained manager and approximately a 6% of untrained sales associates switched status within the period of reference.

To evaluate the relative importance of the alternative mechanisms behind the estimated effects on sales and transactions, we gather information from the two ability surveys (baseline and follow up) and estimate the regression model:

$$T_{i,t} = \delta_0 + \delta_1 D_i + \delta_2 B_t + \delta_3 D_i B_t + v_{i,t}, \qquad (5)$$

where $T_{i,t}$ denotes the skill level of individual $i$ as recorded in period $t$, and $D_i$ and $B_t$ are defined as before, $v_{i,t}$ is the error term.

Following the main objectives of the intervention, we use the scale of leadership as dependent variable for managers, and the measured of communication skills for store personnel. In both cases, the parameter of interest is $\delta_3$ as it identifies the effect of the training on skills under the difference-in-difference strategy.

Table 13 presents the estimated impact of the intervention on skills based on the regression model (5). On average, as a result of the intervention, "treated" managers experience a 0.4 standard deviation increase in the leadership scale relative to the control group. Importantly, despite the small sample size (only 115 managers), the point estimate is significant at 10% level. When we add mall fixed-effects the point estimate increases to a 0.56 standard deviation (column 2) significant at the 5% level.

[[Table 13 near here]]

On the other hand, the results for communication skills suggest a small and non-significant impact of the intervention among sales personnel. This result must be interpreted with caution, as skill measures might not be precise proxies for true skills. Moreover, even though the intervention was aimed at boosting a specific skill, it could have modified other skill dimensions.[30]

[30] We complemented the self-reported measurement of skills with two mystery shop visits before and after

Next, we explore the extent to which the impact on sales reported among managers (column (3) in Table 10) can be explained by the 0.4 standard deviation increase in leadership attributed to the intervention. We do this by adding the interaction between treatment status, time period and leadership to the set of controls in equation 2. The results are reported in column (2) of Table 14, while column (1) repeat the original estimates. After controlling for leadership, the magnitude of the coe cients reduces 73%. Thus, a large fraction of the estimated impact can be linked to changes in leadership. Nevertheless, still more than half of the original point estimates remain unexplained. This, of course, could simply indicate the practical limitations of our skill measures. However, it could also suggest potential spillovers from sales personnel to store managers. Unraveling the relative importance of these alternatives should govern the e orts of the future research agenda on this subject.

[[Table 14 near here]]

## 7. Conclusions

This paper uses an experimental design and a di erence-in-di erence strategy to quantify the impact of a training intervention intended to modify two socio-emotional skills -leadership and communication-among employees of one of the largest retailers in Latin America. Our results confirm the e ectiveness of investing in soft skills as they can trigger productivity gains. A well-targeted on-the-job-training intervention can positively impact workers' performance levels.

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the training in all the stores included in the experiment for Santiago. The store and staff were assessed on 89 dimensions, covering topics such as general environment of the store; availability, presentation and greeting of the staff; correct identification of customer's needs; approach to address the need and offer a solution or product; personal presentation of staff; payment process and overall impression. In stores where only the manager received training (*T1*) we find positive and statistically significant effects on measures of general look of the store, the display of products and its consumer's appealing, Among stores where both managers and staff received training (*T2*) we find positive and significant effects on quality of the service ("the sales associate expressed with clarity and confidence the characteristics of the product"), which is one of the main skills addressed in the staff training. For both *T1* and *T2* we find statistically significant differences with the control stores regarding the personal presentation of the staff.

From our store-level analysis we conclude that, relative to control group stores, the intervention increased daily sales by 119 dollars (10%) in locations where only managers were trained and by 204 dollars (12,1%) when both sales associates and managers received training. The results are robust to different sample definitions. Positive effects also emerge when "daily transactions" is the outcome of interest, suggesting an impact on the extensive margin of sales. In this case, the largest estimated impact comes from stores in which only managers were assigned to training, reaching 11% increase in total transaction per day.

To a large extent, our worker-level estimates confirm the store-level findings, providing additional insights on the effectiveness of the training intervention. For both managers and sales associates, the estimated impacts on both productivity measures (sales and transactions) are unambiguously positive. However, in the case of managers the effect on transactions is small and not statistically significant. This suggests that the large store-level effect reported for the number of transaction when only managers received training might be explained by spillover effects within stores. We exploit the special features of the intervention and the available data to confirm this hypothesis. Training managers and improving their leadership skills not only increase their own sales but also has an indirect effect on the number of transactions and sales of the untrained workers in the stores. These results are in line with the recent literature investigating the role of managers as determinant of worker's productivity (Lazear et al., 2015) and on the effectiveness of management practices (Gosnell et al., 2019). Our results highlight the multiple channels through which manager's training affects the productivity of the firm.

Finally, by assessing the impact of the intervention on skill levels we identify the mechanisms behind our main findings. While for sales associates we do not find any indication of gains in communication skills, among store managers we document a positive and significant effect on leadership/management skills equivalent to 0.4 standard deviations.

We conclude with a word of caution. Even though the extra units of leadership skills can explain a large fraction of the impact on sales, a significant proportion of the impact remains unexplained. This can reflect both the limitations of our skill measures as well as the potential role of spillovers within stores. In this context, understanding and tracking the within store compositional changes that might accompanied interventions like the one studied herein might provide additional insights for explaining the overall impact of training.

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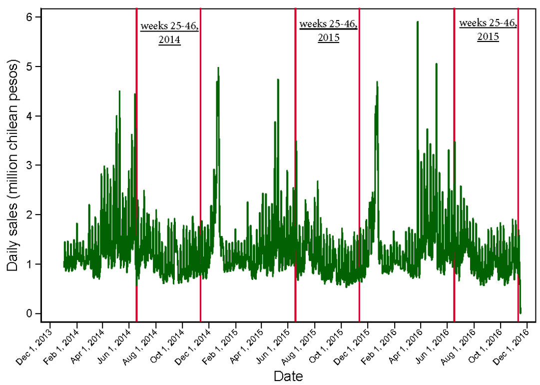
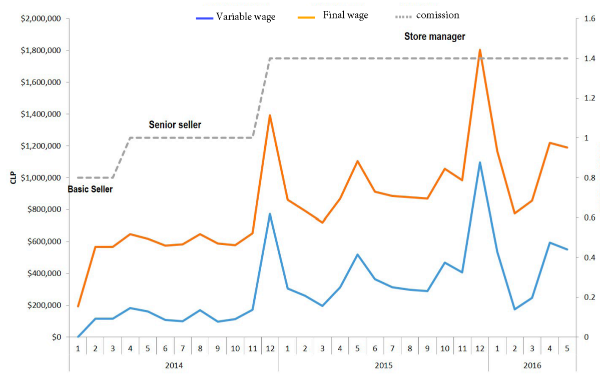
Figure 1: Firm's records on store sales and employee career paths, period 2014-2016



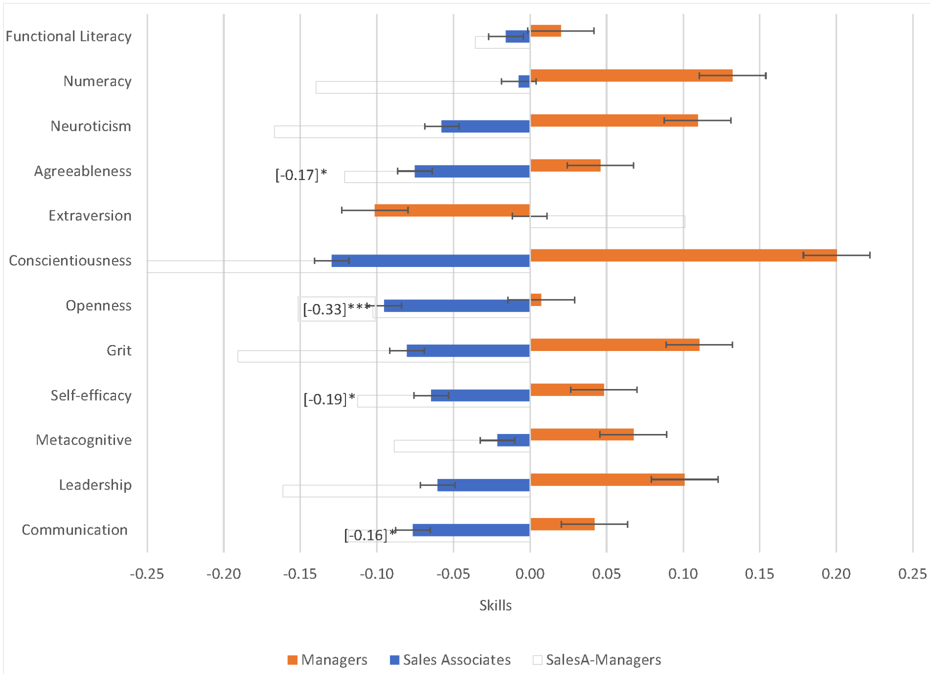

(a) Average Daily Store Sales, 2014-2016




(b) Within firm progression: An example

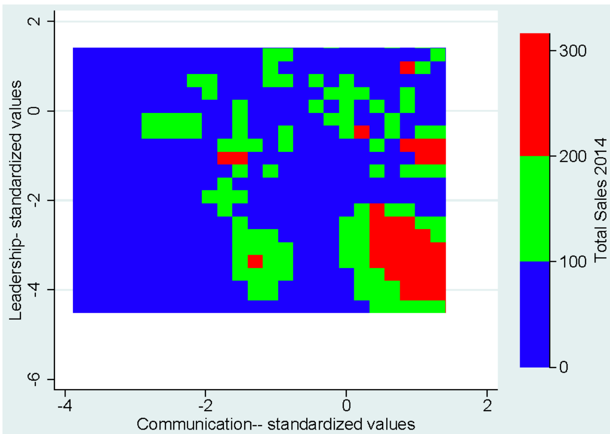
Source: Firm's records.

Figure 2: Di￿erences in Skills at Baseline between Sales Associates and Managers

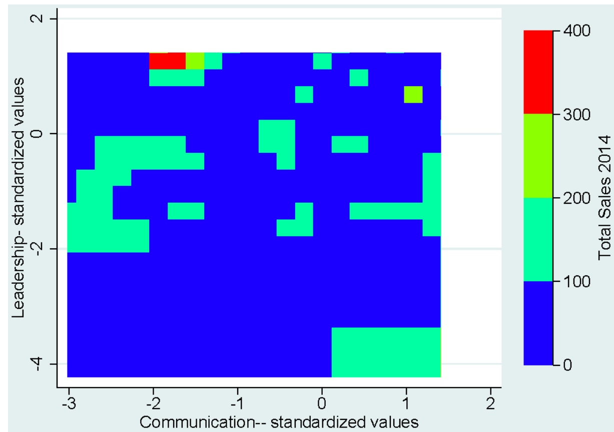



Source: Firm’s records and Skill Survey (baseline)

Figure 3: The Association between Skill Levels (Communication and Leadership) and Total Sales (Millions of CLP) in 2014




(a) Sales Associates




(b) Managers

Source: Firm's records and Skill Survey (baseline).

Table 1: Stores by geographic location and mall restrictions: Overall versus program's participants

| | (1) Total stores | (2) In shopping mall | (3) Large mall* | (4) % in mall (2)/(1) |
|---|---|---|---|---|
| (A) Country | 324 | 246 | 216 | 76% |
| (B) Regions V, VIII and R.M. | 222 | 176 | 155 | 79% |
| (C) 5 selected cities | 193 | 157 | **138** | 81% |
| (C)/(A) × 100 % | 60% | 63% | 64% | |

Note: The program was implemented in the three largest regions of Chile (V, VIII and RM). See Section 3 for further details on the experimental design. *Large mall refers to a shopping mall that has three or more of the firm stores.

Table 2: Intended and Final Treatment Groups: Number of stores

| Intended treatments | Final treatment groups T1 | T2 | T3 | C | Total | Non Compliers | Total Eligible Total |
|---|---|---|---|---|---|---|---|
| T1 | 33 | 0 | 0 | 9 | 42 | 0 | 42 |
| T2 | 1 | 26 | 13 | 0 | 40 | $2^a$ | 42 |
| C | 3 | 0 | 0 | 50 | 53 | $1^a$ | 54 |
| Total | 37 | 26 | 13 | 59 | 135 | 3 | **138** |

Note: (a) Closed stores.

Table 3: Programmed training vs. Actual training: Managers and Sales associates

| | Planned to receive training (1) | | | Actually trained (2) | | |
|---|---|---|---|---|---|---|
| | Managers | Sales associates | Total | Managers | Sales associates | Total |
| T1 | 42 | 0 | 42 | 33 | 1 | 34 |
| T2 | 40 | 179 | 219 | 25 | 62 | 87 |
| C | 0 | 0 | 0 | 3 | 6 | 9 |
| New Hires | | | | 10 | 107 | 117 |
| Total | 82 | 179 | 261 | **71** | **176** | **247** |
| % trained $(2)/(1) \times 100\%$ | | | | 87% | 98% | 95% |

Note: The first panel of the table "Planned to receive training (1)" reflects the original plan according to the randomization process and the number of employees at that time. The information of the second panel of the table "Actually trained (2)" comes from the firm's records of the number of participants that attended and satisfactorily complete training.

Table 4: Summary Statistics: 2014-2016

| **Full sample** | **Controls** | | **T1: Only managers** | | **T2: Managers & sales associates** | | **T3: Only sales associates** | |
|---|---|---|---|---|---|---|---|---|
| | Mean | SD | Mean | SD | Mean | SD | Mean | SD |
| **Outcome variables** | | | | | | | | |
| Total daily store sales (CLP) | 1,328,237 | 1,433,751 | 1,399,018 | 1,254,789 | 1,104,988 | 1,036,414 | 1,371,626 | 1,089,416 |
| Daily sales per worker (CLP) | 176,642 | 151,582 | 190,787 | 156,229 | 166,835 | 143,360 | 195,158 | 144,648 |
| Daily sales per transaction (CLP) | 22,950 | 12,629 | 24,299 | 10,959 | 20,310 | 9,672 | 25,015 | 10,730 |
| Total daily transactions | 63.25 | 68.72 | 60.80 | 51.74 | 55.76 | 43.58 | 58.45 | 44.35 |
| Daily transactions per worker | 8.34 | 6.49 | 8.33 | 6.23 | 8.55 | 6.21 | 8.38 | 5.92 |
| | | | | | | | | |
| **Independent variables** | | | | | | | | |
| Number of workers | 7.10 | 2.72 | 7.20 | 1.87 | 6.53 | 1.58 | 6.94 | 1.37 |
| Weekend dummy | 0.29 | 0.45 | 0.29 | 0.45 | 0.29 | 0.45 | 0.29 | 0.45 |
| Region V | 0.05 | 0.23 | 0.08 | 0.28 | | | 0.20 | 0.40 |
| Region VIII | 0.09 | 0.29 | 0.08 | 0.28 | | | 0.32 | 0.47 |
| Region XIII | 0.85 | 0.35 | 0.83 | 0.37 | 1.00 | | 0.48 | 0.50 |
| Week | 25.67 | 14.51 | 25.82 | 14.48 | 25.75 | 14.55 | 25.67 | 14.50 |
| Variety | 2.64 | 0.51 | 2.63 | 0.50 | 2.56 | 0.53 | 2.70 | 0.47 |
| Brand | 8.14 | 4.58 | 8.47 | 4.30 | 7.57 | 3.97 | 8.41 | 3.17 |
| Brand_short | 1.49 | 0.60 | 1.66 | 0.47 | 1.46 | 0.50 | 1.48 | 0.50 |
| **N. obs.** | **56,373** | | **37,006** | | **25,905** | | **12,970** | |
| **N. stores** | **59** | | **37** | | **26** | | **13** | |

Note: CLP: Chilean Pesos. As a reference, 675 CLP=1 US dollar. Region V, VIII and XIII are dummy variables taking the value of one if the store is located in Valparaíso, Concepción y Metropolitan Region (RM), respectively and zero otherwise. The variable ”Variety” is an indicator of the degree of specialization of the store, it records how many product categories are sold at the store, where the categories are: footwear, clothing, accessories and others. The variables“Brand” and “Brand-Short” identify the main brands sold at each store. The ”Brand” has 15 categories, while the short version of the variable collapses the brands into four categories depending on the average sale price per item.

Table 5: Summary Statistics from Individual-level Data: Skills, Outcomes and Demographic Characteristics

| Variables | Mean | Std Dev | Min | Max | N.ind | N.obs |
|---|---|---|---|---|---|---|
| **A. Skills - Baseline survey (2015)** | | | | | | |
| Communication | 0 | 1 | -4.1 | 1.52 | 1661 | 40159 |
| Leadership | 0 | 1 | -4.52 | 1.55 | 1661 | 40159 |
| Metacognitive | 0 | 1 | -5.96 | 1.55 | 1611 | 38940 |
| Self-efficacy | 0 | 1 | -3.63 | 4.18 | 1549 | 37506 |
| Grit | 0 | 1 | -6.42 | 1.04 | 1661 | 40159 |
| Openness | 0 | 1 | -6.5 | 0.96 | 1661 | 40159 |
| Conscientiousness | 0 | 1 | -5.14 | 1.56 | 1661 | 40159 |
| Extraversion | 0 | 1 | -4.18 | 1.47 | 1661 | 40159 |
| Agreeableness | 0 | 1 | -4.7 | 1.46 | 1661 | 40159 |
| Neuroticism | 0 | 1 | -2.52 | 3.09 | 1661 | 40159 |
| Numeracy | 0 | 1 | -2.17 | 0.95 | 1661 | 40159 |
| Functional Literacy | 0 | 1 | -3.75 | 0.27 | 1661 | 40159 |
| **B. Skills - Follow up survey (2016)** | | | | | | |
| Communication | 0 | 1 | -4.34 | 1.52 | 1569 | 30932 |
| Leadership | 0 | 1 | -4.75 | 1.64 | 1569 | 30932 |
| Metacognitive | 0 | 1 | -6.91 | 1.52 | 1516 | 29819 |
| Self-efficacy | 0 | 1 | -7.48 | 4.13 | 1452 | 28761 |
| Grit | 0 | 1 | -6.34 | 1 | 1569 | 30932 |
| Openness | 0 | 1 | -6.22 | 0.9 | 1569 | 30932 |
| Conscientiousness | 0 | 1 | -5.43 | 1.47 | 1569 | 30932 |
| Extraversion | 0 | 1 | -4.2 | 1.5 | 1569 | 30932 |
| Agreeableness | 0 | 1 | -4.81 | 1.44 | 1569 | 30932 |
| Neuroticism | 0 | 1 | -2.37 | 2.96 | 1569 | 30932 |
| Numeracy | 0 | 1 | -2.16 | 0.91 | 1569 | 30932 |
| Functional Literacy | 0 | 1 | -3.46 | 0.29 | 1569 | 30932 |
| **C. Other Variables of Interest (2014-2016)** | | | | | | |
| Gender | 1.49 | 0.5 | 1 | 2 | 2181 | 47264 |
| Age | 29.44 | 7.81 | 17 | 67 | 2119 | 46302 |
| Region V | 0.06 | 0.23 | 0 | 1 | 4790 | 62901 |
| Region VIII | 0.1 | 0.3 | 0 | 1 | 4790 | 62901 |
| Region XIII | 0.29 | 0.46 | 0 | 1 | 4790 | 62901 |
| Manager | 0.18 | 0.38 | 0 | 1 | 4446 | 62007 |
| Monthly sales | 7.09 | 6.03 | 0 | 87.9 | 1373 | 32383 |
| N. of Transactions | 272.99 | 251.82 | 1 | 5085 | 1373 | 32383 |
| Treatment status of store in t-1 | 1.94 | 0.99 | 0 | 3 | 1134 | 25085 |
| Training status | 0.22 | 0.41 | 0 | 1 | 1141 | 23795 |

Note: The variable training takes the value of one if the individual received training and 0 otherwise. The variables *Treatment status of store in t-1* is a categorical variable taking values from 0 to 3 representing the treatment status of the store where the individual was in the pre-treatment period (t-1) (0-stores not included in the experiment; 1- individuals in T1 stores; 2- for individuals in T2 stores; 3- individuals in control stores).

Table 6: Baseline leadership and communication skill levels as determinants of promotions during 2015

| Variable | (1) | (2) | (3) |
|---|---|---|---|
| Leadership | 0.200** | 0.151* | 0.162* |
| Communication | 0.007 | -0.065 | -0.078 |
| N. of Observations | 790 | 790 | 790 |
| Controls | | | |
| Gender and experience | Y | Y | Y |
| Other socio-emotional skills | N | Y | Y |
| Cognitive skills | N | N | Y |

Source: Authors' own calculations based on firm's information. Leadership and communication skills are standardized measures (mean=0 and variance=1). Sample includes only salespersons (as opposed to store managers) before the promotion. Inference based on clustered standard errors (store-level). ***: 1%, **: 5%, *: 10%.

Table 7: Baseline Leadership and Communication Skill as Determinants of Total Annual Sales in 2015.

| Variables | Pooled | | Sales Associates | | Managers | |
|---|---|---|---|---|---|---|
| | (1) | (2) | (3) | (4) | (5) | (6) |
| Leadership | -0.18 | -1.56 | -0.76 | -2.73 | 18.93* | 15.50 |
| | (2.13) | (2.48) | (2.66) | (3.14) | (9.72) | (13.29) |
| Communication | 5.74*** | 4.62** | 5.92** | 5.45* | -14.52 | -22.91* |
| | (2.12) | (2.33) | (2.63) | (2.91) | (8.63) | (11.96) |
| N. of Observations | 1,173 | 1,173 | 916 | 916 | 257 | 257 |
| R-squared | 0.41 | 0.42 | 0.47 | 0.47 | 0.83 | 0.86 |
| | | | | | | |
| **Controls** | | | | | | |
| Gender & Experience | Y | Y | Y | Y | Y | Y |
| Position | Y | Y | | | | |
| Socio-emotional skills | N | Y | N | Y | N | Y |
| Cognitive Skills | N | Y | N | Y | N | Y |

Source: Authors' own calculations based on firm's information. Leadership and communication skills are standardized measures (mean=0 and variance=1). Inference based on clustered standard errors (store-level). ***: 1%, **: 5%, *: 10%

Table 8: The impact on daily store sales (CLP)
Pre-treatment Sample: Only weeks 25-46 of years 2014 and 2015

| Controls | **Only managers** (1) | **Managers and Sales Associates** (2) | (3) | **Sales Associates** (4) |
|---|---|---|---|---|
| $D_i$ | -93,192.9 | -7,122.5 | 1,871.4 | 127,446.7 |
| | (79,640.1) | (61,908.2) | (69,627.3) | (97,857.8) |
| $B_t$ | -27,769.3 | -24,014.5 | -167,644.8** | -432,615.2*** |
| | (50,786.0) | (69,648.1) | (72,589.0) | (140,992.25) |
| Parameter of interest ($D_i \times B_t$) | **118,812.8**** | **110,905.1*** | **137,979.5**** | **9,110.6** |
| | **(49,166.3)** | **(56,263.2)** | **(64,799.2)** | **(67,328.8)** |
| Year/Week FE | Y | Y | Y | Y |
| Mall FE | Y | Y | Y | Y |
| N. of Observations | 40,757 | 35,829 | 33,781 | 28,467 |
| R-squared | 0.51 | 0.54 | 0.54 | 0.55 |
| Treated Group | $T1$ | $T2$ | $T2$ | $T3$ |
| Post-treatment Period ($B_t^k$) | – | Only managers have completed training | All store employees have completed training | – |

Source: Authors' own calculations based on firm's information. As a reference, 675 CLP=1 US dollar. Regressions include the following set of controls: Number of store's employees, number of products sold at the store, weekend dummies, and region dummies. Inference based on clustered standard errors (mall-level). ***: 1%, **: 5%, *: 10%

Table 9: The impact on the number of daily transactions
Pre-treatment Sample: Only weeks 25-46 of years 2014 and 2015

| | **Only managers** | **Managers and Sales Associates** | | **Sales Associates** |
|---|---|---|---|---|
| Controls | (1) | (2) | (3) | (4) |
| $D_i$ | -3.52 | -2.76 | -2.28 | 6.49 |
| | (3.11) | (2.12) | (2.24) | (4.76) |
| $B_t$ | -6.74*** | -8.65** | 2.51 | -16.20*** |
| | (2.11) | (3.58) | (3.67) | (4.28) |
| Parameter of interest ($D_i \times B_t$) | **6.29**** | **4.29*** | **4.82*** | **1.85** |
| | **(2.86)** | **(2.19)** | **(2.65)** | **(2.14)** |
| Year/Week FE | Y | Y | Y | Y |
| Mall FE | Y | Y | Y | Y |
| N. of Observations | 40,757 | 35,829 | 33,781 | 28,467 |
| R-squared | 0.58 | 0.60 | 0.59 | 0.62 |
| Treated Group | $T1$ | $T2$ | $T2$ | $T3$ |
| Post-treatment Period ($B_t^k$) | – | Only managers have completed training | All store employees have completed training | – |

ource: Authors' own calculations based on firm's information. As a reference, 675 CLP=1 US dollar. Regressions include the following set of controls: Jumber of store's employees, number of products sold at the store, weekend dummies, and region dummies. Inference based on clustered standard errors mall-level). ***: 1%, **: 5%, *: 10%

Table 10: The effect of the intervention on monthly sales (Millions of CLP)
Individual Level Analysis

| **Controls** | Pooled (1) | Sales associates (2) | Managers (3) |
|---|---|---|---|
| $D_i$ | -0.65* | 0.39 | -0.30 |
| | (0.36) | (0.48) | (0.46) |
| $B_t$ | -0.88*** | -1.37*** | -0.88 |
| | (0.27) | (0.46) | (0.67) |
| Parameter of interest ($D_i \times B_t$) | **0.92**** | **0.81*** | **0.90*** |
| | **(0.40)** | **(0.45)** | **(0.48)** |
| Observations | 1,828 | 1,073 | 1,345 |
| R-squared | 0.05 | 0.11 | 0.10 |

Source: Authors' own calculations based on firm's information. Regressions include age at baseline and gender as controls as well as month, year and region fixed-effects. Inference based on clustered standard errors (mall-level). $B$ Is defined so that the pre-treatment period includes information from 2014 and 2015 but only in the same months observed after treatment (September and October for sales associates and July to October for Managers ). As a reference, 675 CLP=1 US dollar. ***: 1%, **: 5%, *: 10%

Table 11: The effect of the intervention on total number of transactions
Individual Level Analysis

| **Controls** | Pooled (1) | Sales associates (2) | Managers (3) |
|---|---|---|---|
| $D_i$ | -30.30* | 5.29 | -4.35 |
| | (16.74) | (17.64) | (19.36) |
| $B_t$ | -60.75*** | -84.23*** | -60.37** |
| | (14.11) | (20.84) | (25.24) |
| Parameter of interest ($D_i \times B_t$) | **40.57**** | **52.91**** | **19.06** |
| | **(16.82)** | **(24.40)** | **(18.19)** |
| Observations | 1,828 | 1,167 | 1,345 |
| R-squared | 0.04 | 0.10 | 0.12 |

Source: Authors' own calculations based on firm's information. Regressions include age at baseline and gender as controls as well as month, year and region fixed-effects. Inference based on clustered standard errors (mall-level). $B$ Is defined so that the pre-treatment period includes information from 2014 and 2015 but only in the same months observed after treatment (September and October for sales associates and July to October for Managers ) ***: 1%, **: 5%, *: 10%

Table 12: Spillovers from Trained Store Managers to Untrained Sales Associates
Individual Level Analysis

| **Controls** | All Sales Associates without Training | | | |
|---|---|---|---|---|
| | Sales | Transactions | Sales | Transactions |
| | CLP | # | CLP | # |
| | (1) | (2) | (3) | (4) |
| $S_{it}$ | 0.52 | 40.28* | 0.65 | 38.42 |
| | (0.61) | (23.58) | (1.00) | (48.01) |
| $B_t$ | -1.39*** | -71.13*** | -1.17*** | -66.85*** |
| | (0.25) | (9.78) | (0.35) | (17.97) |
| Parameter of interest ($S_{it} \times B_t$) | **1.28*** ** | **51.50*** ** | **1.21*** | **48.95*** |
| | **(0.41)** | **(15.97)** | **(0.73)** | **(24.94)** |
| Individual FE | Y | Y | N | N |
| Store at baseline FE | Y | Y | Y | Y |
| Observations | 2,040 | 2,040 | 1,585 | 1,585 |
| R-squared | 0.10 | 0.06 | 0.42 | 0.39 |
| Number individuals | 332 | 332 | | |

Source: Authors' own calculations based on firm's information. In columns (3) and (4) we control for age at baseline and gender and cluster standard errors at mall level. ***: 1%, **: 5%, *: 10%

Table 13: The Effect of the Intervention on Skills

| | Leadership | | Communication | |
|---|---|---|---|---|
| | Managers | | Sales Associates | |
| | (1) | (2) | (3) | (4) |
| $D_i$ | -0.24 | -0.36 | -0.07 | -0.04 |
| | (0.17) | (0.24) | (0.13) | (0.14) |
| $B_t$ | -0.24 | -0.30 | -0.06 | -0.10 |
| | (0.20) | (0.21) | (0.08) | (0.07) |
| **Parameter of interest** ($D_i \times B_t$) | **0.41*** | **0.56*** ** | **0.13** | **0.09** |
| | **(0.24)** | **(0.26)** | **(0.14)** | **(0.14)** |
| Mall FE | N | Y | N | Y |
| Observations | 230 | 230 | 698 | 698 |
| R-squared | 0.03 | 0.17 | 0.03 | 0.11 |

Source: Authors' own calculations based on firm's information. Variables are standardized to have mean zero and SD equal to one. Regressions include age at baseline and gender as control as well as region fixed effects. Inference based on clustered standard errors (mall-level) ***: 1%, **: 5%, *: 10%

Table 14: The effect of the intervention on monthly sales
Individual Level Analysis - Sample of Store Managers

| **Controls** | Original<br>(1) | Including Leadership<br>(2) |
|---|---|---|
| $D_i$ | -0.30 | -0.15 |
| | (0.46) | (0.42) |
| $B_t$ | -0.88 | -0.57 |
| | (0.67) | (0.70) |
| Parameter of interest ($D_i \times B_t$) | **0.90*** | **0.73** |
| | **(0.48)** | **(0.56)** |
| $D_i \times B_t \times$ Leadership | - | **0.22** |
| | - | **(0.44)** |
| Mall FE | Y | Y |
| B: Same months 2014 and 2015 | Y | Y |
| Observations | **1,345** | **1,254** |
| R-squared | **0.10** | **0.11** |

Source: Authors' own calculations based on firm's information. Regressions include age at baseline and gender as controls as well as month, year and region fixed-effects. Inference based on clustered standard errors (store-level) when more than one individual per store is included in the regressions. *B: Same months 2014 and 2015* indicates that pre-treatment period includes information from 2014 and 2015 but only in the same months observed after treatment (July to October for Managers). ***: 1%, **: 5%, *: 10%