Soft Skills Training and Productivity: Evidence from an intervention in retail

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Web Appendix

A. Testing for Parallel Trends

In the context of the difference-in-difference approach, testing for whether the average change in the outcome of interest for the treated group in the absence of treatment equals the average change in outcome for the non-treated group is essential (Abadie, 2005). In what follows we present these tests (parallel trends) for our two outcomes of interest: sales and transactions.

Following Autor (2003), we test the assumption of identical counterfactual trends in treatment and control groups. Let $k = 0$ be the time at which the training intervention took place. We estimate:

$$Y_{j,t} = \beta_0 + \lambda_t + \sum_{l=-m}^{q} \gamma_l \, D_{j,t} \, (t=l) + \beta_4 X_j + u_{j,t}$$

where $Y_{j,t}$ represents the outcome of interest of store j (e.g., sales) in period t, λ_t represents a time fixed-effect (year-week), $D_{j,t}$ is a binary indicator taking a value of one if store j was treated, and equals to zero otherwise; X_j is a vector of store-level controls (at baseline), and $u_{j,t}$ is the error term. Any period before program is defined by m "lags", whereas an after-treatment period is defined by the q "leads". γ_l is the coefficient of the l-th lead or lag. The test for parallel trends becomes $\gamma_l = 0$ for all $l < 0$.

Figure A1 displays the estimated βl for the before and after periods using monthly average daily store sales as the outcome variable and the respective confidence interval (95%). Following our preferred specification, we only include weeks 25-64 in each year, and compare these weeks in 2014 and 2015 with the same weeks in 2016. Each panel displays the visual representation of the test for each treatment (*T1*, *T2* and *T3*). Regardless of the treatment group, the parallel trend assumption holds. Moreover, for *T1* (stores where only managers received treatment), the estimated after treatment effect increases with time. This is consistent with our results of positive impacts on sales. The same is observed for *T2* (stores when both managers and sales associates received treatment). The first vertical line shows when the manager's training took place and the second vertical line marks the period after treatment (when all managers and staff are trained). For *T3*, although the parallel trends assumption holds, no statistically significant effect is detected after treatment.

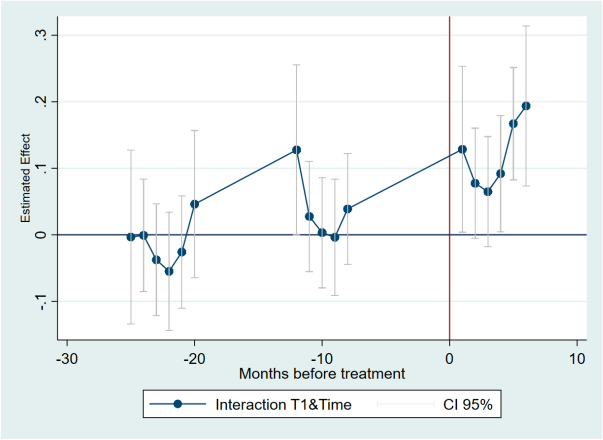
Similarly, Figure A2 presents the estimated βl using monthly average daily transactions per store. In most cases, the assumption of identical counterfactual trends holds. After treatment, the number of transactions increases in all treatment stores. However, the effect seems to fade away with time. Overall, the assumption of identical parallel trends cannot be rejected.

References

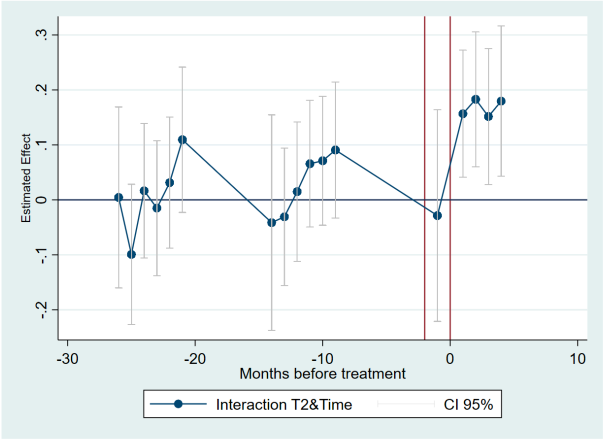
Abadie, Alberto, "Semiparametric Difference-in-Differences Estimators," The Review of Economic Studies, 2005, 72 (1), 1–19.

Autor, David H., "Outsourcing at Will: The Contribution of Unjust Dismissal Doctrine to the Growth of Employment Outsourcing," Journal of Labor Economics, 2003, 21 (1), 1–42.

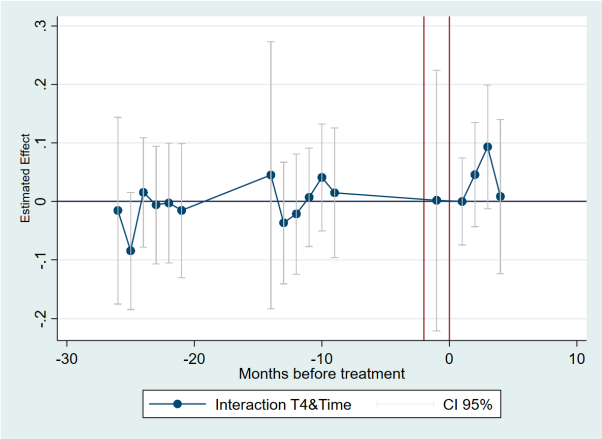
Figure A1: Estimated Effects by Month Before and After Treatment: Store Sales T1, T2 and T3



(a) T1: Only Managers vs controls

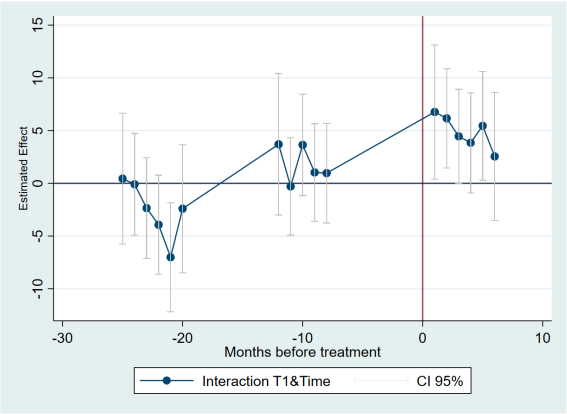


(b) T2: Managers sales associates vs controls

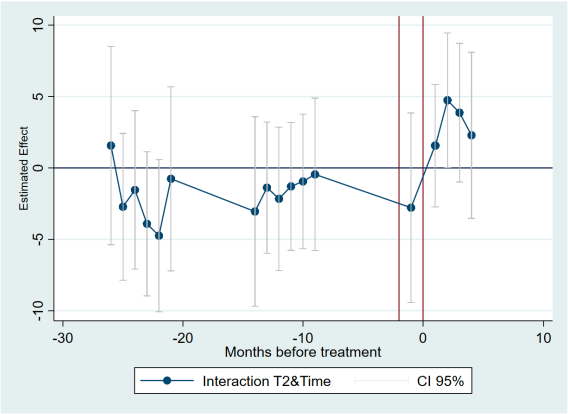


(c) T3: Sales associates vs controls

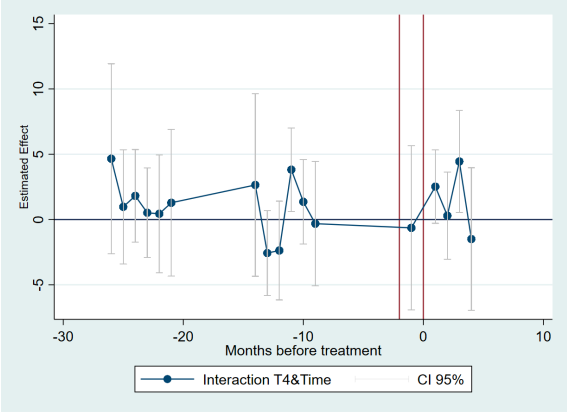
Figure A2: Estimated Effects by Month Before and After Treatment: Store Transactions T1, T2 and T3



(a) T1: Only Managers vs controls



(b) T2: Managers sales associates vs controls



(c) T3: Sales associates vs controls

B. Additional Tables

Table A1: Modules and objectives- Management program

Day	Objectives
Day 1 – Managing yourself	Enhance managers' self-knowledge and understand how they control their own personal effectiveness. This interactive day provides the managers with the tools to help manage problems in the store, encourage teamwork and become a role model for their team. Leadership and management skills.
Day 2 – Managing communication and influencing	Enhance the managers' personal effectiveness with communication and influencing techniques, this day focuses on effective communication skills (the use of positive language, emphatic listening) that can be used to build effective relationships, achieve targets and motivate staff.
Day 3 – Managing others	Enhance the managers' personal effectiveness in communicating and managing others through effective delegation, conflict management and negotiation.
Day 4 – Managing and achieving company's targets	Enhance and understand the role of assertiveness and clear focus required by the Manager to achieve company's targets, this session helps the Managers develop techniques to achieve business goals whilst dealing with people and situations. Confidence, self-control and decision making in difficult times, communication skills to empower the members of the team, tools to learn how to prioritize individual and team work to achieve business goals.
Day 5: Coaching for Success	Learn the theory behind coaching and how to use it to influence team members and identify individual potential Develop the managers' coaching skills, providing the tools and techniques required to identify different types of staff and how to motivate and train them.

Table A2: Modules and objectives: Team program

Module	Objectives
1: To serve I	Understanding what customer service excellence means at the company, the benefits of delivering it and the behaviors and skills needed to meet company's expectations.
2: To serve II	Knowing your customers, understanding company's store and brands, creating impact through strong first impressions of you and your store (non-verbal communication)
3: To understand I	Greeting your customer, identifying the needs and meeting the expectations of your customer, being an ambassador for your store. Applied communication skills.
4: To understand II	Use communication skills to show empathy and looking after customer concerns, and to deal with conflict situations
5. To carry out I	Understanding your role in sales and what is selling, influencing the customer and the sales cycle
6. To carry out II	The selling process at the company
7. To sell	Understanding and communicating technical details of the products sold to customers.
8. To impact	Recognizing internal and external clients and adapting communication styles to different customers
9. To communicate I	Contact points in the customer's journey, positive talking to customers
10. To communicate II	Communication techniques and tools to be confident. Communication with different customers and cultures.
11. To identify	Learn about the selling process (4p's) and the role of communication
12. To optimize your service	Develop a personal Action plan and your assessment

Table A3: Balance tests: Differences between groups in Baseline Variables $t-1$

	T1 vs C		T2 vs C		T3 vs C		T1 vs T2		T1 vs T3		T2 vs T3	
Variables	**Dif.**	**t**	**Dif.**	**t**	**Dif.**	**t**	**Dif.**	**t**	**Dif.**	**t**	**Dif.**	**t**
Region V	0.02	0.66	-0.06	1.00	0.14	1.03	-0.06	1.17	-0.12	1.06	-0.20	1.10
Region VIII	-0.04	1.11	-0.13	1.37	0.20	1.18	-0.12	1.37	-0.24	1.42	-0.32	1.32
Region XIII	0.02	0.37	0.19	1.76	-0.33	2.44	0.19	1.85	0.35	2.75	0.52	2.43
Weekend dummy	0.00	0.04	0.00	0.49	0.00	1.54	0.00	0.17	0.00	1.49	0.00	0.65
Variety	-0.01	0.16	-0.06	0.91	0.05	0.45	-0.09	1.30	-0.07	0.47	-0.14	1.23
Brand	0.20	0.27	-0.80	0.64	0.17	0.23	-0.72	0.58	0.03	0.03	-0.89	0.97
Brand (short)	0.13	1.22	0.03	0.34	-0.04	0.20	-0.07	0.60	0.18	0.80	-0.02	0.09
Store sales (CLP)	59,905	0.38	-80,323	0.46	46,617	0.21	-239,330	1.21	13,845	0.06	-285,553	1.05
Sales per worker (CLP)	11,419	0.92	-7,908	0.36	17,996.3	0.71	-13,144	0.60	-6,484	0.23	-31,065	0.91
Sales per transaction (CLP)	1,572	1.15	-2,793	1.53	2,325	0.69	-2,437	1.34	(749.7)	0.26	-4,765.2	1.67
Number of transactions	-3.77	0.51	1.57	0.22	-5.73	0.67	-8.78	0.92	1.99	0.23	-3.01	0.37
Transactions per worker	-0.23	0.38	0.44	0.50	-0.11	0.12	-0.01	0.01	-0.11	0.11	0.11	0.11
N obs.	79,687		67,405		70,488		59,811		41,302		32,103	

Note: Test of differences calculated using errors clustered at the mall level according to the experimental design. The statistical mean difference tests are generated using information for the years 2014 and 2015. 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 A4: Summary Statistics: Weeks 25-46

Weeks 25-46	**Controls**		**T1: Only managers**		**T2: Managers & sales associates**		**T3: Only sales associates**	
Variable	Mean	SD	Mean	SD	Mean	SD	Mean	SD
Outcome Variables								
Total daily store sales (CLP)	1,137,428	1,064,322	1,208,916	1,029,819	954,439	824,250	1,172,217	852,781
Daily sales per worker (CLP)	157,618	123,549	166,021	128,083	145,704	115,778	169,532	116,430
Daily sales per transaction (CLP)	22,936	10,918	24,109	9,827	20,283	9,021	24,707	9,819
Total daily transactions	51.79	47.25	51.73	41.90	47.76	34.83	49.86	35.35
Daily transactions per worker	7.21	5.14	7.17	5.14	7.41	5.07	7.31	5.03
Number of workers	6.96	2.14	7.14	1.71	6.48	1.53	6.86	1.27
Independent Variables								
Weekend dummy	0.28	0.45	0.28	0.45	0.28	0.45	0.28	0.45
Region V	0.07	0.25	0.08	0.28	-	-	0.21	0.41
Region VIII	0.09	0.29	0.08	0.27	-	-	0.32	0.47
Region XIII	0.84	0.37	0.84	0.37	1.00	-	0.47	0.50
Week	35.41	6.35	35.40	6.35	35.46	6.36	35.41	6.35
Variety	2.62	0.52	2.62	0.51	2.55	0.53	2.69	0.47
Brand	8.14	4.27	8.48	4.29	7.59	3.95	8.37	3.19
Brand_short	1.53	0.54	1.65	0.48	1.47	0.50	1.47	0.50
N. observations	**24,844**		**16,439**		**11,448**		**5,731**	

Notes: CLP: Chilean Pesos. As a reference, 675 CLP=1 US dollar. Region V, VIII and XIII are Vina, Concepcion y Metropolitan region, respectively. 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 A5: Summary Statistics from Individual-level Data: Skills and Main Outcomes. Sample Used in the Regressions

Variables	Mean	Std Dev	Min	Max	N.ind	N.obs
A. Skills in baseline survey (2015)						
Communication	-0.06	1.02	-4.1	1.52	817	19163
Leadership	-0.03	1.05	-4.52	1.55	817	19163
Metacognitive	-0.01	1.09	-5.96	1.55	794	18605
Self-efficacy	-0.04	0.99	-3.63	4.18	751	17610
Grit	-0.05	1.08	-6.42	1.04	817	19163
Openness	-0.08	1.09	-6.5	0.96	817	19163
Conscientiousness	-0.07	1.04	-5.14	1.56	817	19163
Extraversion	-0.02	1.02	-4.18	1.47	817	19163
Agreeableness	-0.05	1.02	-4.7	1.46	817	19163
Neuroticism	-0.03	0.97	-2.52	3.09	817	19163
Numeracy	0.02	1.02	-2.17	0.95	817	19163
Functional Literacy	-0.01	1.02	-3.75	0.27	817	19163
B. Skills in follow up survey (2016)						
Communication	-0.08	1.05	-4.34	1.52	435	30932
Leadership	-0.03	1.03	-4.75	1.64	435	30932
Metacognitive	0.02	1.02	-6.91	1.52	420	29819
Self-efficacy	0.04	1.07	-7.48	4.13	399	28761
Grit	-0.03	1.04	-6.34	1	435	30932
Openness	-0.02	0.92	-6.22	0.9	435	30932
Conscientiousness	0.02	0.99	-4.28	1.47	435	30932
Extraversion	-0.09	0.99	-3.53	1.5	435	30932
Agreeableness	-0.07	1	-4.81	1.44	435	30932
Neuroticism	0.05	0.93	-2.37	2.96	435	30932
Numeracy	0.02	0.99	-2.16	0.91	435	30932
Functional Literacy	0.09	0.84	-3.46	0.29	435	30932
C. Other Variables of Interest 2014-2016						
Gender	1.52	0.5	1	2	735	18784
Age	29.5	7.76	18	60	717	18510
Region V	0.08	0.28	0	1	1141	23795
Region VIII	0.1	0.3	0	1	1141	23795
Region XIII	0.62	0.49	0	1	1141	23795
Manager	0.22	0.41	0	1	1141	23711
Monthly sales	6.6	5.78	0	59.04	613	14109
No Transactions	237.69	227.77	1	5085	613	14109
Treatment status of store in t-1	2.11	0.84	1	3	1047	23063
Training status	0.22	0.41	0	1	1141	23795

Note: The variable training status is a dummy that takes the value of one if the individual received training and 0 otherwise. The variable *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 A6: The impact on daily store sales (CLP)
Store Level Analysis

Controls	**T=1 vs Control** (A)	**T=2 vs Control** (B)	**T=2 vs Control** (C)	**T=3 vs Control** (D)
D_i	86,529.8	124,850.7	135,010.3	45,795.8
	(112,397.2)	(137,579.5)	(140,071.2)	(227,075.6)
B_t	-28,823.0	-3,223.7	238,949.5***	-313,917.8***
	(71,745.8)	(64,380.4)	(64,173.04)	(107,873.5)
Parameter of interest ($D_i \times B_t$)	**70,635.8**	**106,100.88***	**132,323.3***	**16,702.5**
	(73,873.6)	**(59,420.8)**	**(63,684.3)**	**(70,367.5)**
Year/Week FE	Y	Y	Y	Y
Mall FE	Y	Y	Y	
Observations	90,553	76,787	76,765	67,235
R-squared	0.48	0.41	0.41	0.09
Post treatment definition	Only manager completed training	Only manager completed training	Manager and Sales associates completed training	Only sales associates completed training

Source: Authors' own calculations based on firm's information. As a reference, 680 CLP=1 US dollar (September 2016). 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 A7: The impact on the number of daily transactions
Store Level Analysis

	T=1 vs Control	**T=2 vs Control**	**T=2 vs Control**	**T=3 vs Control**
Controls	(1)	(2)	(3)	(4)
D_i	-6.81	-1.21	-0.33	-0.37
	(5.09)	(6.23)	(6.03)	(9.76)
B_t	4.52	4.38	2.35	3.42
	(5.36)	(4.17)	(4.21)	(3.76)
Parameter of interest ($D_i \times B_t$)	**5.88**	**6.28***	**5.59**	**0.88**
	(3.73)	**(3.20)**	**(3.35)**	**(2.88)**
Year/Week FE	Y	Y	Y	Y
Mall FE	Y	Y	Y	Y
Observations	90,553	79,790	79,767	67,235
R-squared	0.54	0.52	0.52	0.57
Post treatment definition	Only manager completed training	Only manager completed training	Manager and Sales associates completed training	Only sales associates completed training

Source: Authors' own calculations based on firm's information. 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 A8: The effect of the intervention on monthly sales (Millions of CLP)
Individual Level Analysis

Controls	Pooled	Sales associates	Managers
	(1)	(2)	(3)
D_i	-0.69	0.19	0.02
	(0.43)	(0.55)	(0.61)
B_t	-0.84***	-0.83***	-1.32**
	(0.30)	(0.28)	(0.54)
Parameter of interest ($D_i \times B_t$)	**1.01****	**1.11****	**0.55**
	(0.43)	**(0.44)**	**(0.55)**
Observations	8,922	5,575	3,687
R-squared	0.14	0.22	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). ***: 1%, **: 5%, *: 10%

Table A9: The effect of the intervention on total number of transactions
Individual Level Analysis

Controls	Pooled	Sales associates	Managers
	(1)	(2)	(3)
D_i	-31.04	-1.44	1.75
	(20.38)	(21.84)	(23.11)
B_t	-3.07	-3.83	-20.74
	(10.85)	(9.63)	(19.25)
Parameter of interest ($D_i \times B_t$)	**42.05****	**60.00****	**10.50**
	(19.29)	**(25.10)**	**(21.60)**
Observations	8,922	5,575	3,687
R-squared	0.11	0.16	0.13

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%