

Manuscript version: Author's Accepted Manuscript

The version presented in WRAP is the author's accepted manuscript and may differ from the published version or Version of Record.

Persistent WRAP URL:

<http://wrap.warwick.ac.uk/112980>

How to cite:

Please refer to published version for the most recent bibliographic citation information. If a published version is known of, the repository item page linked to above, will contain details on accessing it.

Copyright and reuse:

The Warwick Research Archive Portal (WRAP) makes this work by researchers of the University of Warwick available open access under the following conditions.

Copyright © and all moral rights to the version of the paper presented here belong to the individual author(s) and/or other copyright owners. To the extent reasonable and practicable the material made available in WRAP has been checked for eligibility before being made available.

Copies of full items can be used for personal research or study, educational, or not-for-profit purposes without prior permission or charge. Provided that the authors, title and full bibliographic details are credited, a hyperlink and/or URL is given for the original metadata page and the content is not changed in any way.

Publisher's statement:

Please refer to the repository item page, publisher's statement section, for further information.

For more information, please contact the WRAP Team at: wrap@warwick.ac.uk.

Is personal initiative training a substitute or complement to the existing human capital of women? Results from a randomized trial in Togo

Francisco Campos¹, Michael Frese^{2,3}, Markus Goldstein¹, Leonardo Iacovone¹

Hillary C. Johnson¹, David McKenzie¹, Mona Mensmann³

Business training programs that aim to teach women basic business skills have struggled to show sustained impacts on business profitability and growth (e.g. McKenzie and Woodruff, 2014). In a recent study (Campos et al, 2017), we showed that personal initiative training - a psychology-based mindset training program that develops key behaviors associated with a proactive entrepreneurial mindset - delivered lasting improvements for both male and female business owners in Togo. In this short paper, we show that these results hold when restricted to just women alone, and then examine whether the effectiveness of this training for women differs with their existing level of human capital.

Although there is relatively little literature on how the returns to business training vary with initial human capital, there is a general presumption in much of the broader education and training literature of dynamic complementarity, whereby earlier human capital increases the productivity of subsequent learning (e.g. Carneiro and Heckman, 2003; Cunha and Heckman, 2007). In the context of business training, this complementarity might occur in the learning process itself (higher human capital individuals may better understand and learn what is taught in training), as well as in the implementation of skills learned (higher human capital individuals might run larger and more complex businesses in which there is more scope to employ new business practices).

¹ The World Bank, Washington D.C. 20433

² National University of Singapore, Singapore

³ Leuphana University of Lüneburg, Germany

However, there are also reasons why individuals with lower initial levels of human capital may be more likely to benefit more from business training. One possibility occurs at the participation margin, where Ariga and Brunello (2006) note that individuals with more human capital are likely to have higher opportunity costs of attending training. Second, there may be multiple pathways to figuring out optimal steps to take to grow the business, with different forms of human capital all substitutable for one another. For example, highly educated women may learn by themselves the need to develop new products which differentiate themselves from other businesses, while training may be more important in helping less educated women to do this. The presence of other frictions such as credit constraints may also set a ceiling on the scale the business can grow, so that diminishing returns to human capital accumulation set in.

I. The Intervention and Sample

Our sample consists of 789 female-owned microenterprises in Lomé, Togo, who were applicants to a government project financed by the World Bank.⁴ The mean owner is 42.7 years old, has 7 years of schooling, and has been running her firm for a mean (median) of 13.6 years (12 years). The majority (71%) of the firms are in commerce, and earned a mean (median) of CFA 80,000 (35,000) in monthly profits at baseline, equivalent to US\$168 (\$74).⁵ The median firm had one employee other than the owner at baseline, and the mean 1.9 workers.

⁴ The full sample also included 711 male-operated firm. Randomization was stratified by gender, and we focus on the female-operated sample for this paper. See Campos et al. (2017) for results for the pooled sample.

⁵We use the exchange rate of 1USD = 476 CFA prevailing at the time of the baseline survey (December 2013) for all currency conversions in this paper.

Firms were stratified by sector (within gender), and then grouped into triplets by baseline profits. Within each triplet, firms were then randomly assigned to a control group (N=264), traditional business training treatment group (N=263), and personal initiative training treatment group (N=262).

Those assigned to treatment were then invited to attend one of the two different training programs. A first group was offered the Business Edge training program developed by the International Finance Corporation. This is a traditional training program that focuses on teaching firm owners how to do accounting and financial management, improve their marketing practices, implement human resource management policies, and formalize. Take-up was 82.9 percent. The second group was offered a personal initiative training program. This focuses on teaching a mindset of self-starting behavior, innovation, identifying and exploiting new opportunities, goal-setting, planning and feedback cycles, and overcoming obstacles. Take-up was 86.3 percent.

Both training programs consisted of 12 three-hour sessions taught three times a week in April 2014, followed by a trainer visiting the business for three hours once a month for the next four months. Conditional on attending training, the median woman attended all 12 sessions in both treatment groups. The courses were similar in the cost to provide, at approximately US\$750 per participant, but were offered at the highly subsidized fee of 5000 CFA (approximately US\$10).

Campos et al. (2017) provide more details on both training programs.

We then measure impacts through four rounds of follow-up surveys conducted between September 2014 and September 2016, which track business outcomes for up to 2 years and 5 months after training took place. The survey response rates were high, ranging from 94.8 percent in the first

follow-up to 88.0 percent in the final follow-up. Key business outcomes were pre-specified and set out in a registered pre-analysis plan.⁶

II. Main Impact for Women

We begin by estimating the intention-to-treat impacts on key business outcomes of women being assigned to one or the other of the two training programs. We pool together all four follow-up rounds to maximize power (McKenzie, 2012), thereby estimating the average impacts over the 2.5 years post-intervention. For outcome Y , we estimate the following equation for firm i at time t :

$$Y_{i,t} = \alpha + \beta_T \text{TraditionalTraining}_i + \beta_{PI} \text{PersonalInitiativeTraining}_i + \gamma Y_{i,0} + \sum \theta_s 1(i \in s) + \sum_{j=1}^4 \delta_j 1(j = t) + \varepsilon_{i,t} \quad (1)$$

Where *TraditionalTraining* and *PersonalInitiativeTraining* are dummy variables for assignment to the Business Edge and Personal Initiative training programs respectively, $Y_{i,0}$ is the baseline value of the outcome, θ_s are randomization triplet fixed effects, δ_j are survey round fixed effects, and the error term $\varepsilon_{i,t}$ is clustered at the firm level.

Table 1 reports these treatment effects. The traditional business training program did not have a significant effect on any of our business outcome measures. In contrast, personal initiative training increases business sales (although this is not statistically significant), business profits, and an aggregate index of standardized z-scores of our different profits and sales measures. These treatment effects are significantly different from the impacts of standard training. The impact is large, with the 31,446 CFA increase in monthly profits equivalent to a 39.6 percent increase on the control group mean. In terms of cost-effectiveness, this increase of approximately \$US66 per month would cover the cost of providing this course within one year.

⁶ <https://www.socialscienceregistry.org/docs/analysisplan/329/document>

III. How do Impacts vary with Existing Human Capital of Women?

A key question is then the extent to which the effectiveness of this personal initiative training varies with the initial human capital of female entrepreneurs.

Figure 1 provides a first exploration, plotting local linear regressions by treatment status of mean profits for each firm over the four follow-up survey rounds against human capital. The first panel shows a relatively constant treatment gap across schooling levels. The second panel looks at the Raven test score, and suggests the treatment effect is greater for those with lower abstract reasoning or fluid intelligence than those with high scores. The final panel examines heterogeneity by the initial level of business practices used in the firm (McKenzie and Woodruff, 2017), and suggests a larger treatment effect for those with better management skills to begin with. In all three cases, the treatment line lies above the control line across the whole range, but we get three different patterns of whether personal initiative training is more effective for those with higher initial human capital versus for those with lower human capital.

We examine this more formally in Table 2, using six pre-specified measures of human capital, along with a first principal component of all these measures. A first reason that existing human capital might have a differential effect is through whether people attend training. Column 2 uses only the personal initiative training group and presents marginal effects from a probit of attending training on each of these human capital measures. We find that each of our human capital measures does have a positive impact on the likelihood of attending training, with this effect statistically significant for years of schooling, having done previous business training, and for the overall human capital principal component measure. 97.2 percent of those who had previously attended a business training course went to the personal initiative course when offered, compared to 84 percent of those who had not previously attended training. This correlation with prior schooling and prior training may reflect selection on those with lower costs of attending or with a higher

taste for classroom learning, or could potentially be a causal impact whereby those with previous schooling and training may be better at being able to concentrate and learn from classes.

We then test whether there is heterogeneity in the ITT effects of personal initiative training by using the control group and personal initiative training samples and estimating:

$$\begin{aligned}
 Y_{i,t} = & \alpha + \beta_{PI} \text{PersonalInitiativeTraining}_i \\
 & + \beta_{PIH} \text{PersonalInitiativeTraining}_i * H_i + \beta_H H_i \\
 & + \gamma Y_{i,0} + \sum \theta_s 1(i \in s) + \sum_{j=1}^4 \delta_j 1(j = t) + \sum_{j=1}^4 \rho_j H_i * 1(j = t) + \varepsilon_{i,t} \quad (2)
 \end{aligned}$$

Where H_i denotes the (demeaned) human capital measure of interest, we allow the time effects to vary with this baseline human capital, control for the direct effect, and are then interested in the interaction effect β_{PIH} .

Columns (3) to (5) of Table 2 report β_{PIH} for the outcomes of personal initiative, monthly profits, and our profits and sales index respectively. The main effect of training is a 0.18 increase in personal initiative, significant at the 1 percent level. Column 3 then shows that we cannot reject that this improvement in personal initiative does not vary with any of our measures of human capital. Column 4 shows no significant heterogeneity in the impact on profits by human capital, although some of the point estimates are similar in magnitude to the overall treatment effect, and confidence intervals are wide.

Column 5 examines heterogeneity in the impact on our overall index of business profits and sales performance. The only measure which is significant is previous business training ($p=0.039$), with the ITT impact three times as large for those who have had previous training as those who did not. Part of this could reflect the greater training participation of this group seen in column 2, so in column 6 we estimate the local average treatment effect (LATE) heterogeneity. This weakens the significance of the heterogeneity in impact by prior training ($p=0.065$). None of the other measures

of human capital show any significant heterogeneity on the overall index measure, and our principal component measure of human capital has a near zero point estimate on the LATE.

IV. Conclusions

There are theoretical reasons why different types of business training might be more effective for those who already begin with a higher existing base of human capital, but also reasons why it might help substitute for a lack of other forms of human capital and thereby have higher impacts for those with lower human capital. Our analysis of a successful personal initiative business training program in Togo suggests that neither effect is first-order for women: the training is successful for those with all levels of schooling, and does not show significant heterogeneity with a range of different human capital measures. While statistical power is an issue, so that further testing in larger samples would be useful, these results do suggest that this new training approach can be effective for women with a wide range of existing human capital levels.

REFERENCES

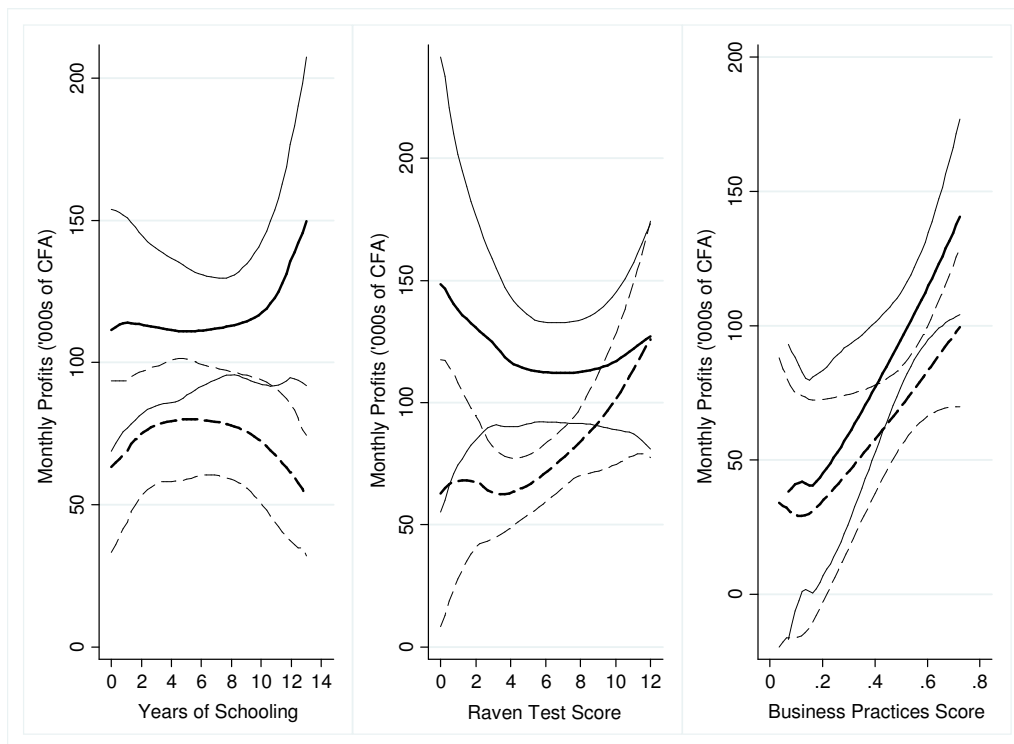
- Ariga, Kenn and Giorgio Brunello (2006) “Are education and training always complements? Evidence from Thailand”, *Industrial and Labor Relations Review* 59(4): 613-629.
- Campos, Francisco, Michael Frese, Markus Goldstein, Leonardo Iacovone, Hillary Johnson, David McKenzie and Mona Mensmann (2017) “Teaching personal initiative beats traditional business training in boosting small business in West Africa”, *Science*, 357(6357): 1287-90.
- Carneiro, Pedro, and James J. Heckman (2003) “Human Capital Policy.” In *Inequality in America: What Role for Human Capital Policies?*, ed. James J. Heckman, Alan B. Krueger and Benjamin M. Friedman. Cambridge, MA: MIT Press.
- Cunha, Flavio and James Heckman (2007) “The technology of skill formation”, *American Economic Review* 97(2): 31-47.

McKenzie, David (2012) “Beyond baseline and follow-up: The case for more T in experiments”, *Journal of Development Economics* 99(2): 210-21.

McKenzie, David and Christopher Woodruff (2014) “What are we learning from business training evaluations around the developing world?” *World Bank Research Observer*, 29(1): 48-82

McKenzie, David and Christopher Woodruff (2017) “Business practices in small firms in developing countries”, *Management Science* 63(9): 2967-81

Figure 1: Heterogeneity in Impact of Personal Initiative Training for Women by Baseline Human Capital Measure



Notes: Local linear smoothed curves fitted for average profits over the four follow-up rounds for female-owned firms assigned to the personal initiative training treatment (solid lines) and the control group (dashed lines). 95 percent confidence intervals around fitted curves are shown. X-axes show data up to the 95th percentile of the respective human capital measure.

Table 1: Impact of Training Programs on Survival, Profitability and Sales of Female-Operated Firms

	Business Survival	Monthly Sales	Monthly Profits	Weekly Profits	Profits and Sales Index
Traditional Business Training	0.003 (0.010)	-45,305 (80,896)	4,047 (8,221)	841 (2,434)	0.020 (0.038)
Personal Initiative Training	-0.016 (0.011)	133,050 (81,700)	31,446*** (8,877)	6,928*** (2,465)	0.118*** (0.040)
Number of Observations	3021	2940	2940	2936	2940
Number of Firms	789	784	784	784	784
Test of Equality of Treatments p-value	0.081	0.017	0.003	0.013	0.014
Control Group Mean	0.961	683,798	79,337	24,977	-0.041

Notes:

Data are from four survey rounds collected by the authors, and show average impact over the 2.5 years post-training. All regressions include randomization strata and survey wave dummies. Huber-White robust standard errors in parentheses, clustered at the firm level.

*, **, and *** denote significance at the 10, 5, and 1 percent levels respectively.

Sales are winsorized (capped) at the 99th percentile and Profits at the 1st and 99th percentile, reducing the influence of outliers, and are expressed in terms of real CFA francs.

Profits and sales index is the mean of standardized z-scores of our various profit and sales measures.

F-test used to test equality of impacts of the two training programs.

Table 2: Does Baseline Human Capital Affect Personal Initiative Training Effectiveness?

	(1)	(2)	(3)	(4)	(5)	(6)
Variable		Marginal Effect on Training	Interaction with ITT Impact on Personal Initiative	Interaction with ITT Impact on Monthly Profits	Interaction with ITT Impact on Profits & Sales Index	Interaction with LATE Impact on Profits & Sales Index
Mean		Attendance				
<i>Human Capital Measure</i>						
Years of Schooling	8.6	0.016*** (0.004)	0.005 (0.006)	-963 (2391)	0.003 (0.011)	-0.001 (0.013)
Raven score	7.2	0.005 (0.006)	0.005 (0.008)	-3667 (3752)	-0.010 (0.016)	-0.014 (0.019)
Previous Business Training	0.19	0.198** (0.096)	-0.005 (0.060)	22859 (27691)	0.275** (0.133)	0.259* (0.140)
Sectorial Experience above Median	0.51	0.018 (0.043)	-0.001 (0.052)	35413 (24542)	0.123 (0.117)	0.141 (0.139)
Baseline Business Practices	0.57	0.137 (0.147)	0.047 (0.221)	28539 (83768)	0.425 (0.436)	0.486 (0.506)
Baseline Personal Initiative	4.2	0.037 (0.046)	0.002 (0.065)	-27123 (23223)	-0.047 (0.112)	-0.077 (0.131)
Human Capital Principal Component	0.00	0.041*** (0.015)	0.004 (0.020)	-4963 (8997)	0.022 (0.043)	0.013 (0.049)
Sample Size		255 to 262	1845 to 1911	1886 to 1952	1886 to 1952	1886 to 1952

Notes: Huber-White standard errors in parentheses, clustered at the firm level.

Column 2 shows marginal effects from a probit of training attendance against the human capital measure.

Columns 3 to 5 show the coefficient on the interaction between being assigned to treatment and the particular human capital measure.

Column 6 shows the coefficient on the interaction between receiving treatment and human capital, instrumented by assignment to treatment interacted with this human capital measure.