Make me believe: Self-efficacy and human capital investments among young women in Ghana

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Abstract

Programs aimed at fostering development typically target external constraints, such as limited access to education, credit, or social protection. However, engagement with these programs often remains low. Internal psychological constraints may represent a barrier to investment decisions and, thus, hinder individuals' ability to take advantage of these programs. This paper examines the impact of a pre-registered randomized testimonial campaign designed to boost self-efficacy—beliefs about one's ability to succeed—among young women in Ghana who registered for a free training program. The campaign significantly raised self-efficacy, but it did not affect overall take-up rate. Among those who started, the campaign increased training performance and completion rates. Consistent with a model of behavioral investment traps, effects were concentrated among women with intermediate education levels and initially lower self-efficacy. These results suggest that jointly addressing internal and external constraints can enhance human capital investments. (JEL: C93, D83, I25)

Keywords: self-efficacy, training participation, women, experiment.

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1. Introduction

Poverty can create self-reinforcing cycles that trap individuals at low levels of wealth or human capital. Traditional development theories attribute these "traps" to constraints that are external to the individual, such as limited opportunities for human capital development, restricted access to credit, inadequate infrastructure, or market imperfections (Azariadis and Drazen 1990; Banerjee and Newman 1993; Dasgupta and Ray 1986; Galor and Zeira 1993). More recent theoretical contributions broaden this perspective and argue that internal, psychological constraints, such as aspirations, norms, or values, also play a key role in shaping decision-making and behavior. They propose that while behavioral biases (internal constraints) are universally present, under conditions of poverty (external constraints), behavioral biases result in worse outcomes (e.g., Bertrand et al. 2004; Dalton et al. 2016).[1]

Development cooperation efforts primarily address external constraints to foster economic growth and reduce poverty. Public projects invest in areas such as public administration, infrastructure, social protection, transportation, education, and health, among others. However, many initiatives aimed at addressing these external constraints frequently experience low participation and completion rates. For example, many programs that provide social protection or free education and training programs often fall below 50% of the eligible population or initially enrolled individuals, although they are shown to be effective in providing substantial benefits to participants (Alfonsi et al. 2020; Alzúa et al. 2016, 2021; Bandiera et al. 2020, 2023; Banerjee et al. 2021, 2024; Bhattacharya et al. 2015; Carneiro et al. 2019; Chakravarty et al. 2019; Crépon and Premand 2024; Dupas and Jain 2024; Frohnweiler et al. 2024; Hardy and McCasland 2023; Maitra and Mani 2017; Shonchoy et al. 2018). Appendix Table A.I.1 presents an overview of program benefits, participation rates, and completion rates as reported in recent evaluation studies of training and welfare programs. The table highlights the wide geographical scope of these studies, the heterogeneity in program impacts, and the substantial variation in take-up and completion rates across programs. Interventions addressing misperceptions of program benefits (Alzúa et al. 2021; Finkelstein and Notowidigdo 2019; Hastings et al. 2015; Jensen 2010) or reducing application costs (Banerjee et al. 2021; Carneiro et al. 2019) have only partially bridged the gap. Beyond the unrealized opportunities for individuals, low engagement leads to unused capacity, program delays, or costly repetitions of enrollment processes.

In this pre-registered study, I assess whether engagement with a standard development program can be enhanced by incorporating an intervention that targets internal constraints. The program targeted limited access to human capital development by providing a free

1. These theories pick up ideas from early models within anthropology that define internal constraints as a potential source for behavioral biases that create a culture of perpetuating poverty (e.g., Appadurai 2004; Lewis 1966) Small et al. (2010) summarize the literature on culture as potential explanation for the behavior of the poor.

vocational skills training in the fashion industry for young women in Ghana. My intervention targets internal constraints with a testimonial campaign for a random subsample of women who registered for the training program. The campaign aims to increase women's self-efficacy through testimonials of women with similar backgrounds who narrate how goal-setting, building confidence, and developing resilience and perseverance helped them to overcome challenges and succeed in life. Self-efficacy is defined as the belief about one's capacity to successfully accomplish specific tasks or goals and cope with challenges (Bandura 1978, 1997; Schwarzer and Jerusalem 1995). Descriptively, self-efficacy has been shown to regulate aspirations, motivations, and achievements (Bandura 1993), and is recognized as an important component of psychological empowerment (Zimmerman 2000). For adolescents in Ghana, Ansong et al. (2019) show that self-efficacy is an important correlate of educational aspirations and actual achievements.[2] Exploiting the randomized assignment of the testimonial campaign, I study its causal effect on training engagement using self-reported and administrative records on training start, training performance, and training completion.

In 2021, women in the Ghanaian cities of Accra, Kumasi, and Tamale could enroll in a free vocational skills training program in the fashion industry. The training exclusively targeted women aged 16 to 24 years. Its design integrated a variety of features identified in previous evaluations as being most beneficial to participants' subsequent labor market outcomes (Agarwal and Mani forthcoming; Carranza and McKenzie 2023; Kluve et al. 2017, 2019). Moreover, a comprehensive registration process, which included career and counseling services aimed at screening interested women, and the payment of monthly stipends during the training largely minimized pre-identified common external constraints to training participation. Frohnweiler et al. (2024) provide a detailed description and analysis of the program. Thanks to the randomized allocation of training slots, Frohnweiler et al. (2024) can show that the training significantly increased participants' employment probability in their field of specialization, enhanced job quality in terms of formality and access to medical benefits, and improved mental health.[3] Nevertheless, only 53.9% of the invited women started the training. To address anticipated challenges with training engagement, the training program was combined with the testimonial campaign studied in this paper.

The testimonial campaign was delivered remotely. It consisted of two three-minute videos delivered via links embedded in text messages and 30 follow-up text messages. The first video was sent after registration and before the training started. The second video and follow-up messages were sent during the training. Women were randomly assigned to one out of three

2. Roy et al. (2018) find similar evidence for young women in India.

3. We evaluated the training program through a randomized controlled trial, in which only a random subset of registered and eligible women were invited to the training. The testimonial campaign was cross-randomized across training treatment assignment. In the evaluation of the testimonial campaign, I concentrate on the women who were invited to start the training.

experimental arms. One third (N=362) received testimonials related to self-efficacy. One third (N=362) received placebo testimonials in which alike women talked about their experience with vocational training, reiterating the information that had been shared with all study participants during the registration process. Another third (N=385) received no testimonials.

The delivery of the testimonial campaign was successful: 35.0% of the women assigned to the self-efficacy testimonials clicked on the video links and treated women are 19.9 percentage points more likely to report having watched the self-efficacy videos eight months after receiving the last text message than women assigned to the control group. The take-up of the placebo testimonials was equally successful. Notably, most women who report having watched the videos also recall their content. These rates are comparable to or even higher than in other message-based interventions (e.g., Bahety et al. 2021; Banerjee et al. 2020). Moreover, the testimonials significantly increased treated women's self-efficacy levels by 0.13 standard deviations (SD) relative to untreated women. The effect size is comparable to effects found by intensive face-to-face interventions (John and Orkin 2022; McKelway 2024). Other psychological outcomes remained unchanged: treated and untreated women do not significantly differ in terms of mental health, self-esteem, conscientiousness, or life satisfaction.

In terms of training engagement, the testimonials did not affect women's overall probability of starting the training program. But, they increased the probability of completing the training among women who started the training by 8.1 percentage points, which is an increase of 10.5% compared to untreated women. Additional analyses show that while the testimonials induced compositional changes in terms of who starts the training, they do not explain the effects on training completion. Instead, the effect seems to be driven by a more motivated engagement of treated women with the training. Women who were sent the self-efficacy testimonials reported a higher perceived usefulness of the training and were more likely to be among the best-performing trainees, as reflected in being selected for a nationally accredited skills examination and job placement offers upon training completion.

To rule out that the effect of the self-efficacy testimonials is explained by a simple reminder mechanism of receiving multiple text messages that women associate with the training, I make use of the placebo testimonials. The placebo group received the same number of videos and text messages with identical design, and their delivery was equally successful. Consistent with a placebo interpretation, I find no effect of these testimonials on women's self-efficacy or their perceptions of the benefits of vocational training. Most importantly, the placebo testimonials did not significantly affect training take-up or completion rates, supporting the interpretation that it was the increase in self-efficacy that affected training engagement. Moreover, my results are not affected by selective attrition and are robust to randomization inference and the inclusion of additional control variables.

My results are consistent with predictions from the behavioral poverty trap framework of Dalton et al. (2016). Adapting their framework to the context of vocational training as a human

capital investment decision and self-efficacy, the concept of a behavioral trap suggests that individuals may underinvest not only due to worse starting conditions, i.e., external constraints, but also due to low self-efficacy levels that discourage investments.[4] Specifically, low self-efficacy might reduce the likelihood of initiating or persisting in training. This limited engagement then perpetuates a cycle: without investment, individuals miss the potential benefits that could elevate their self-efficacy, reinforcing their initial low self-efficacy and limiting future engagement. The framework further implies that the effectiveness of interventions targeting self-efficacy depends on their baseline levels of self-efficacy and human capital. While individuals with high initial capital invest regardless of self-efficacy levels, those with low initial capital do not invest even when self-efficacy is high. Instead, individuals with intermediate human capital will invest only if they have sufficiently high self-efficacy levels. Consistent with that, I find that the campaign's effects on training completion are concentrated among women with medium levels of baseline education and low baseline self-efficacy. Additional heterogeneity analyses show stronger effects among women who likely face higher external constraints to participation because of their marital status, childcare responsibilities, lower household wealth, or linguistic barriers.

The present study stands out from previous literature in three ways. First, I add to the literature on how internal constraints shape individuals' decision making. The recent theoretical literature on poverty traps argues that, in addition to the long-standing focus on external constraints, individuals also face internal constraints that might perpetuate poverty (Dalton et al. 2016; Genicot and Ray 2017; La Ferrara 2019). Aside the numerous studies assessing the effect of programs targeting external constraints, an increasing number of empirical studies confirms that interventions targeting aspirations (Bernard et al. 2023), personal initiative (Campos et al. 2017), hope (Rojas Valdes et al. 2022), patience (Alan and Ertac 2018; Blattman et al. 2017), grit (Alan et al. 2019), and mental health (Baranov et al. 2020) can affect behavior in terms of labor market performance, future-oriented investments, and saving behavior, among others. However, these studies address internal constraints alone. Studies that jointly address external and internal constraints are scarce. Exceptions are Bossuroy et al. (2022) and Orkin et al. (2023) that cross-randomize cash transfers with psychosocial workshops addressing internal constraints. While Orkin et al. (2023) find that the investment-promoting effect of a aspiration and planning workshop in Kenya is crowded out when combined with the cash transfer, the results from Bossuroy et al. (2022) suggest that in their setting of Nigeria the integration of a psychosocial intervention was able to maximize the effectiveness of the cash transfer program in terms of economic outcomes, psychological well-being, and empowerment. My campaign design allows to examine the role of self-efficacy as potential internal constraints in influencing individuals'

4. The original theoretical framework of Dalton et al. (2016) assesses wealth and aspirations. Based on the extensive literature showing a strong interplay between self-efficacy and aspirations (e.g., Ansong et al. 2019; Bandura 1993; Roy et al. 2018; Zimmerman 2000), I expect self-efficacy to play a similar role to aspirations in shaping individuals' investment decisions.

ability to capitalize on training opportunities that aim to alleviate external constraints. The setting is particularly relevant because, first, individuals are exposed to the campaign exactly at the time when they are to make their investment decision, i.e., shortly before and during the training. Second, the study sample consists of relatively vulnerable women who, despite their initial commitment to participate, might be more likely to reconsider participation when confronted with everyday shocks or caregiving responsibilities. Third, the training program design minimizes external constraints as much as possible through free provision and monthly stipends. And lastly, an accompanying RCT-based program evaluation shows that the training benefited participants in terms of job quality and mental health but only around 50% started the training (Frohnweiler et al. 2024).

Second, I contribute to the scarce knowledge on determinants of low participation in post-secondary training. Extensive literature exists on the effectiveness of vocational training in both developed (e.g., Berg and Vikström 2022; Biewen et al. 2014; Carruthers and Sanford 2018; Knaus et al. 2022; Osikominu 2013; Schmidpeter and Winter-Ebmer 2021) and developing countries (e.g., Adoho et al. 2014; Alzúa et al. 2021; Attanasio et al. 2011; Bandiera and Goldstein 2010; Bandiera et al. 2020; Carranza and McKenzie 2024; Chakravarty et al. 2019; Frohnweiler et al. 2024; McKenzie 2017). Even though many of these training programs continue to report low take-up rates, little is known about determinants of training participation and knowledge is especially scarce for developing countries. The limited number of evaluations considering determinants of participation primarily focus on external constraints, such as unanticipated adverse shocks or competing opportunities (Ambler et al. 2021; Cho et al. 2013). Interventions trying to increase participation and completion are rare and rather concentrate on the recruitment process (Ambler et al. 2021; Osman and Speer 2024). This is despite the fact that results from Bandiera et al. (2020) suggest that the effects of an empowerment program for young women in Uganda might be most impactful for those who are least likely to take up the program. My contribution is twofold. First, I estimate the causal effects of self-efficacy through a randomized testimonial intervention designed to alleviate internal constraints to participation and completion. Second, I apply machine learning techniques to identify the relative importance of variables in a rich individual-level dataset, including both internal and external factors, for predicting training participation. Results show that self-efficacy has the second highest relative importance for predicting training start and the highest relative importance for training completion.

Third, I add to the causal evidence on the effects of interventions targeting self-efficacy. Aside from multiple descriptive studies (Ansong et al. 2019; Bandura 1993; Zimmerman 2000; Roy et al. 2018), causal evidence on the relevance of self-efficacy for decision-making is scarce. Moreover, interventions that rigorously evaluate the effects of self-efficacy are limited to intensive and costly face-to-face sessions. In India, McKelway (2024) shows that a 7.5-hour psychosocial intervention spread over nine sessions increased women's self-efficacy and translated into an increased employment probability. Eden and Aviram (1993) target self-efficacy among a small

sample of 66 unemployed vocational workers in Israel and show that increased self-efficacy raised job search activity and reemployment among participants with low initial self-efficacy. With a slightly less intensive intervention of two in-person sessions, John and Orkin (2022) are able to increase self-efficacy and subsequently increase preventive health investment among young women in rural Kenya. Because of persistent gender gaps in aspirations (Molina and Usui 2023), earnings expectations (Reuben et al. 2024), educational attainment (Bentaouet Kattan et al. 2023; Encinas-Martín and Cherian 2023), as well as job search behavior and labor market outcomes (Cortés et al. 2023), women, especially young women, are the primary target group for self-efficacy and related psychological interventions in this literature. In line with that, my sample consists of young Ghanaian women facing economic and social hardship. In contrast to previous studies, my self-efficacy campaign was delivered entirely remotely through videos and text messages. The results indicate that such a low-cost and scalable intervention format can effectively increase self-efficacy, with effects of a similar magnitude to in-person formats.

The remainder of the paper is organized as follows: Section 2 describes the study setting, intervention design, randomization, sample characteristics, and outcome measures. Section 3 provides a descriptive analysis of which individual-level baseline characteristics predict training participation and completion. Section 4 introduces a basic theoretical framework motivating the intervention and subsequent analysis. Section 5 outlines the empirical specification, reports the impact of the testimonials on self-efficacy and training engagement, and discusses robustness checks, mechanisms, and heterogeneities. Section 6 concludes.

2. Setting and experimental design

2.1. Vocational training and the N4G program

Vocational training programs are among the most frequently implemented labor market interventions in development cooperation. Global organizations such as the World Bank, ILO, and UNESCO advocate for well-functioning Technical and Vocational Education and Training (TVET) systems, recognizing their potential to address the high levels of youth un(der)employment, widespread informality, skill shortages, and low job quality in Sub-Saharan Africa (ILO 2022; World Bank 2012, 2019; World Bank et al. 2023). Aligned with this vision, the fourth Sustainable Development Goal calls for expanded and equitable access to TVET (United Nations and Development 2015) and the Africa's Development Dynamics 2024 report highlights improved TVET access as a core policy priority for addressing skills shortages and changing skills demand in African countries (AUC and OECD 2024).

In Ghana, vocational training is delivered primarily in two formats: formal TVET and informal apprenticeships. Approximately 10-20% of vocational training takes place within formal TVET institutions, which typically follow a school-based approach, though they vary widely in ownership, accreditation, program length, and costs. Government-owned TVET institutions are

nationally accredited and offer programs that last around three years without tuition fees, though students must cover costs for exams, uniforms, and materials. These institutions are frequently criticized for their weak alignment with industry needs and the low quality of instruction (CTVET 2020; Dadzie et al. 2020; AUC and OECD 2024). Programs at private institutes often run by establishments in the specific occupations, offer shorter programs, and charge high fees. The informal apprenticeship model is by far the most common, accounting for the remaining 80-90% of basic skills training in Ghana. Regardless of training type, everyone can register for examinations with the National Vocational Training Institute (NVTI), which only assess practical skills and provide nationally recognized occupation-specific certification at various proficiency levels (CTVET 2020).

From 2021 to 2023, the German Agency for International Cooperation (GIZ) in Ghana, in partnership with the Ghanaian non-profit organization Samira Empowerment and Humanitarian Projects (SEHP), launched a vocational skills training program called N4G.[5] N4G incorporated a range of program elements that previous evaluations identified as most effective in benefiting participants (Agarwal and Mani forthcoming; Carranza and McKenzie 2023; Kluve et al. 2017). It stands out from other training opportunities in Ghana by combining the practical, hands-on approach typical of informal apprenticeships with the structured, formalized elements of institutionalized training programs, all delivered in a highly condensed format. N4G offered training in three occupations—Dressmaking, Hairdressing, and Beauty Therapy—across the cities of Accra, Kumasi, and Tamale, with program durations ranging from two to six months. The training was provided for free and provided monthly stipends of GHS 200 to cover transportation and food expenses (see Frohnweiler et al. (2024) for a more detailed program description).

Eligible women could sign up at community events held between April and November 2021 for a chance to get access to N4G. The program's main target group were female head porters, and communities were selected based on project partners' local knowledge of where many head porters live and work. Head porters work in marketplaces, carrying goods for traders and shoppers using buckets or baskets balanced on their heads. They often work for minimal fees and endure harsh and unstable working and living conditions. Many of them (temporarily) migrated from more rural areas to the cities to accumulate savings and enable a living at home. They are commonly perceived as a vulnerable group frequently facing exploitation and violence. The registration process involved two interviews: a shorter interview to assess eligibility and an in-depth interview

5. N4G is the abbreviation for *Network for Enterprise Development Learning through Sewing for Girls*.

covering socioeconomic status, employment, and other aspects.[6] Between interviews, career and counseling sessions informed women about the program details. In total, 1,575 eligible women registered, out of which 1,109 were randomly selected and invited to N4G. The remaining 466 women were not invited and were excluded from the subsequent analysis.[7]

A rigorous impact evaluation of N4G showed that while N4G had muted effects on overall employment and income, it led to occupational sorting, substantially improved job quality, and enhanced psychological wellbeing. Women invited to N4G were more than twice as likely to work in their preferred field of specialization, more likely to hold written labor contracts (7.4 pp) and access to medical benefits (5.4 pp), and reported reductions in anxiety (3.4 pp) and stress (0.9 pp). Additional effects included delayed marriage (8.0 pp) and increased bank account ownership (6.8 pp) (Frohnweiler et al. 2024).

2.2. Testimonial campaign

The testimonial campaign contained two videos and up to 30 follow-up text messages. The first video was sent after the registration but before the N4G training started and aimed at affecting women's decision to begin the training. The second video and follow-up text messages were sent during the training period and targeted women's decision to continue and complete the training. Since the registration events took place on different days across communities, the gap between receiving the first video and the scheduled training start ranged from two weeks to six months (median: 72 days) and the gap between the two videos spanned from five weeks to five months (median: 82 days). Figure 1 outlines the intervention sequence and Appendix Figure A.II.3 details the exact timing of every campaign component for each individual study participant.

The videos had a duration of three minutes and were delivered through text messages containing a brief introduction to the video and a personalized link to a private YouTube channel.[8] To ease access to the videos, individuals received a mobile money transfer of GHS 2 shortly after the messages with the video link, to cover mobile data expenses.[9] The videos

6. Only women aged 16 to 24 years with at most a completed senior high school degree, no prior training participation within the fashion industry, and no childcare responsibilities were eligible. These eligibility criteria were defined by GIZ Ghana and SEHP. Upon registration, study participants were asked for their written consent to participate in the survey, allow their contact details be used for follow-up interviews, and permit the use of anonymized data for research purposes. Everyone who registered was informed that only a random subset will get access to the N4G training program.

7. The women not invited to N4G formed the control group of the rigorous impact evaluation of the N4G training program. Table A.III.1 summarizes the baseline characteristics of the 1,109 women included in the baseline survey.

8. Videos could only be accessed with a personalized link and could not be accessed through the search function.

9. Money was transferred in form of airtime for individuals who reported to have a smartphone and in form of phone credit for individuals without smartphone. Even though the pure control group did not receive any videos, they also received the two money transfers.

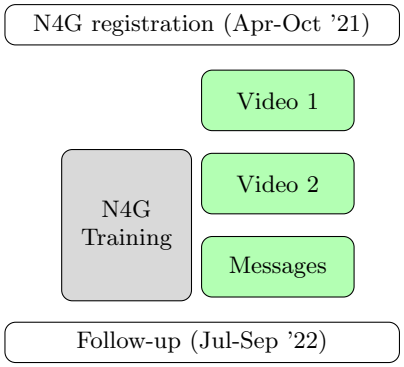


FIGURE 1. Intervention timeline

were available in basic English, Dagbani, and Twi, and participants received the video in the language that matched their language proficiency reported during the registration. The text messages were written in basic English, addressed women by their first name, and were sent at 6am on Wednesdays, Fridays, and Sundays. Treated individuals received a minimum of two and a maximum of 30 follow-up messages (median: 26). The lower number of text messages is explained by the fact that some trainings lasted only 2 months and that message delivery stopped once the training period ended.

Appendix II shows screenshots from the videos and examples of the text messages. The videos were produced by a professional Ghanaian filmmaker and featured Ghanaian women from similar socioeconomic background as the N4G registrants. The self-efficacy videos portrayed two women—a welder and a business owner for organic-beauty products—who shared personal stories of overcoming challenges in their employment paths. The content was designed to build self-efficacy by drawing in multiple well-established psychological mechanisms. First, the videos provided vicarious experiences through relatable role models who demonstrated that success is attainable despite setbacks. Second, the testimonials conveyed verbal encouragement, emphasizing that perseverance, setting small and achievable goals, and learning from others can lead to progress. Finally, the narratives acknowledged common emotional struggles—such as anxiety and self-doubt, but highlighted strategies for emotional regulation, thereby promoting the belief that such barriers can be managed and overcome. While the self-efficacy testimonials did not explicitly reference vocational training, they aimed to foster a general sense of confidence and agency that could support individuals in pursuing such opportunities.

In addition to the self-efficacy testimonials, I also designed a placebo testimonial version in which four women working as a fashion designer, baker, hairdresser, and car sprayer shared their experience with vocational training.[10] The videos were designed to closely mirror those in the self-efficacy arm in tone, length, and production quality, only the content differed. Instead

10. The content was the same for all women assigned to the placebo testimonials irrespective of the occupation they registered for. The placebo testimonials included four women to cover a broader range of occupations, but this should not affect how women engaged with the videos.

of focusing on personal beliefs or motivational messages, these testimonials provided neutral information about vocational training. The women described their decision to pursue training and how it equipped them with manual and entrepreneurial skills, provided them with a certificate, enabling them to find employment or start their own business. This content closely mirrored the information shared with all women during the career and counseling sessions that formed part of the N4G registration process. Thus, I refer to this arm as the placebo testimonials group.[11] The follow-up messages repeated or expanded the respective video content of the two testimonial versions and occasionally repeated the personalized video links.

2.3. Randomization and sample characteristics

The 1,109 women invited to participate in the N4G training program form the study sample and were randomly assigned to one out of three experimental arms (see Table 1).[12] One third, the treatment group, received the videos and messages on self-efficacy. Another third, serving as a placebo treatment group, received the videos and messages on potential benefits of vocational training. The last third, the pure control group, received no videos or text messages. Randomization was stratified by baseline characteristics, including registration city, selected training occupation, employment status, educational level, self-efficacy, and smartphone ownership. For the analysis, the sample is limited to subjects interviewed both at baseline and follow-up, resulting in a final study sample of 1,009 observations.[13]

Table 1. Intervention sample across treatment arms and survey waves.

	Testimonials			
	Self-efficacy (1)	Neutral (2)	None (3)	Total (4)
Baseline (2021)	362	362	385	1,109
Follow-up (2022)	328	332	349	1,009

Note: Table shows the distribution of study participants across treatment arms and data collections.

11. The analysis focuses on the effects of the self-efficacy testimonials by comparing women who were sent the self-efficacy testimonials to women who were not sent any testimonials. This allows a more targeted analysis of the mechanisms behind the effects of the self-efficacy testimonials as a whole. The placebo testimonials will be used to assess potential reminder effects.

12. The focus on study participants who received access to the N4G training program is based on two interrelated considerations. First, the sample of individuals not invited to N4G is substantially smaller (452 women) than the sample of invited women. Second, due to the mechanically induced difference in training access, the intervention's effects on vocational training participation could not be meaningfully analyzed across participants with and without access to N4G. Only 6.8% of those without N4G access started alternative training programs, and only 1.0% completed such a program providing insufficient variation in training engagement outcomes to serve as a basis for a robust analysis.

13. In Section 5.4, I discuss the results of an attrition analysis.

Appendix Table A.III.1 shows that key demographic characteristics, personality traits, pre-treatment outcomes, and the distribution across program components are balanced across the three experimental groups. The program's age restriction of 16 to 24 years was strictly enforced, with an average age of 21 years. At baseline, i.e., at the time of registration, 39% of the participants were married and 19% had at least one child. The majority had either completed junior high school (30%) or senior high school (46%). Regular employment was low among participants (78% were not regularly employed), resulting in a low average monthly income of 8.59 USD and average weekly working hours of 10.6. Geographically, the majority of participants were located in Accra (63%), and most registered for Dressmaking (48%). Confirming the status of head porters as vulnerable group, 26% reported that they know someone who had transactional sex, 6% reported that they themselves had transactional sex, and 18% had limited knowledge about reproductive health.

2.4. Outcome measures

The main outcome variables of the analysis are self-efficacy and training engagement. I measure self-efficacy using the four-point Generalized Self-Efficacy (GSE) scale introduced by Schwarzer and Jerusalem (1995). The GSE scale is based on separate survey items which are then used to generate an index that varies between zero and one. The follow-up survey included four items referring to the following statements for which respondents had to indicate their level of (dis)agreement: (1) *I can always manage to solve difficult problems if I try hard enough*, (2) *When I am confronted with a problem, I can usually find several solutions*, (3) *It is easy for me to stick to my aims and accomplish my goals*, and (4) *I am confident that I could deal efficiently with unexpected events*. The GSE scale is frequently used to measure self-efficacy, including in developing country contexts (e.g., in India and Kenya by John and Orkin 2022; McKelway 2024; Roy et al. 2018).

For training engagement, I rely on a set of indicators for training start, completion, and performance based on self-reported and administrative data. The self-reported data was collected in the follow-up survey six months after the N4G training ended. Participants were asked whether they started and completed the N4G training or any other training program. They further responded to questions about the usefulness of the training, participation in an NVTI certificate examination, as well as whether they received and accepted a job placement offer by the training provider. Administrative data is drawn from attendance sheets submitted by training providers, on which participants confirmed daily attendance with a signature.

3. Descriptive analysis

Take-up of the N4G training was low. Appendix Figure A.III.1 shows that among invited women, only 53.9% started the N4G training and 44.2% completed it. The majority of participants who

discontinued did so within the first 10 days of training (Appendix Figure A.III.2). The most common reason for dropping out, and the second most common reason for not starting, was that individuals were no longer available, either due to starting a job, enrolling in another education format, or having to fulfill family obligations (Appendix Figure A.III.3).[14]

These low take-up rates and drop-out reasons may suggest that some women chose not to start or complete the N4G training because better alternatives became available. However, the rigorous impact evaluation by Frohnweiler et al. (2024), summarized in Section 5.4, indicates that participating in the N4G program was a welfare-improving decision on average. Additionally, women hold very positive perceptions of vocational training and its benefits. At registration, women expected substantial monetary gains from completing vocational training (+USD 34 in monthly income, at median), with 94.8% believing it improves employment opportunities and 93.7% believing it increases social status. This suggests that low perceived benefits are not a primary bottleneck in this context and underscores the importance of identifying the key predictors of training engagement in a setting where beliefs about vocational training are generally very optimistic.

The decision to participate in a training program may be influenced by a multitude of interlinked factors. Rigorous impact evaluations often dispose of datasets that contain relatively few individuals but a rich set of baseline characteristics, with strong inter-dependencies between variables and potential interactions in the relation of these variables with the outcome. Linear models are unlikely to provide a good fit for such data. Machine learning (ML) techniques, while not ideal to identify the relevance of single parameters, are powerful tools to flexibly investigate relationships based on data with complex interactions by showing the relative importance of variables (Mullainathan and Spiess 2017; Baiardi and Naghi 2024). In settings with a large number of covariates relative to sample size, ML models can outperform traditional methods as they apply regularization techniques to identify the most predictive covariates (Baiardi and Naghi 2024).[15]

Thus, I apply the *random forest* ML algorithm, introduced by Breiman (2001), and include all 137 individual baseline characteristics as covariates to identify the most important predictors of training participation.[16] Figure 2 presents the prediction results. The importance measure illustrates how much each baseline variable improves the accuracy of predicting training start and completion. Baseline self-efficacy is the second highest-ranking variable for predicting

14. Logistic difficulties, like women not knowing about their invitation to the N4G program, were the most frequent response for why women invited to the N4G training did not start. Women were informed about their invitation via text messages and follow-up calls by training providers.

15. Existing studies apply ML to household and individual-level data, for example, to predict poverty (McBride and Nichols 2015), labor market performance (Yamada and Otchia 2022; McKenzie and Sansone 2019), optimal labor hiring (Chalfin et al. 2016), or high school dropout (Sansone 2019).

16. For missing values I impute zero together with a missingness indicator, adding 43 more variables.

training start and the highest-ranking variable for predicting training completion. This provides descriptive evidence for the relevance of self-efficacy for individuals' decision to invest in post-secondary training. Other covariates that may also reflect individuals' internal constraints, such as risk tolerance, patience, and mental health factors such as anxiety and depression also rank highly in explaining training participation. Results are similar when applying the random forest only to the subset of control individuals who did not receive any testimonials (Appendix Figure A.III.5).

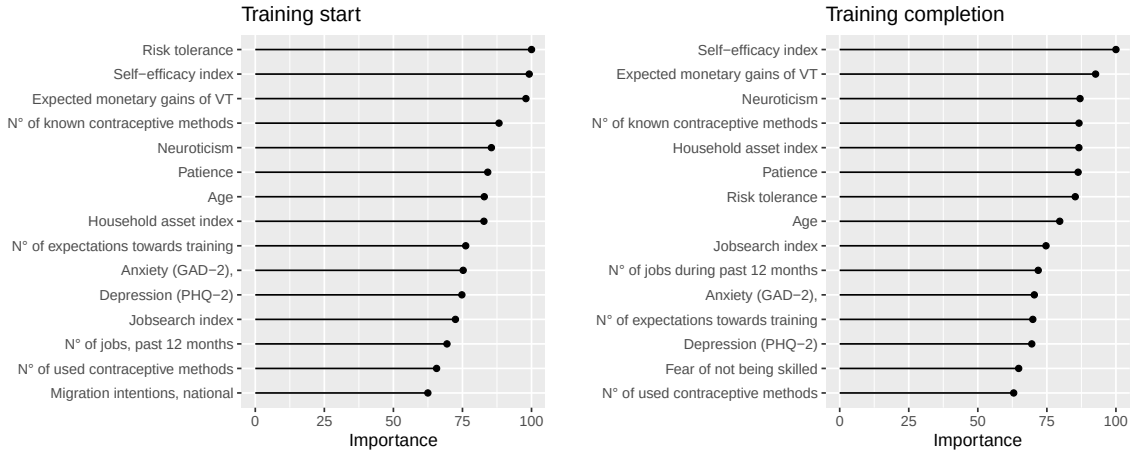


FIGURE 2. Determinants of training participation.
Note: The figure shows the relative importance of the 15 most important baseline characteristics of study participants in explaining the decision to start (left) and to complete the N4G training (right) identified through random forest.

To get an intuition about the direction of the predicted relationships, I use the 15 most important variables identified by random forest in an OLS regression to estimate the probability of training start and completion of the N4G training (Appendix Table A.III.2, Panel A). The results show that a one standard deviation increase in the self-efficacy index is associated with a 3.7 percentage point increase in the probability of starting the training, equivalent to an 6.9% increase relative to the overall N4G take-up rate of 53.9%. The baseline variables selected by random forest account for only 11.7% of the variance in training start.

In sum, the descriptive and ex-post random forest analysis highlights the importance of internal constraints, particularly self-efficacy, in driving training participation, a factor that would likely remain overlooked by alternative methods commonly used in the literature.

4. Theory of a behavioral investment trap

Recent economic theories recognize that, beyond the traditional components of costs and benefits, internal psychological factors also shape individuals' investment decisions. One potentially relevant dimension is self-efficacy, which refers to individuals' beliefs in their ability to successfully accomplish specific tasks and cope with challenges. It captures one's beliefs about ability, not ability itself. The concept was first introduced by Bandura (1978) and later extended by Sherer

et al. (1982) to encompass a more general belief in one's ability to achieve goals across domains. Building on this work, Schwarzer and Jerusalem (1995) developed the widely used Generalized Self-Efficacy (GSE) scale.

In the following, I build on the behavioral model of internal constraints proposed by Dalton et al. (2016). While they explore how low aspirations can generate a behavioral investment trap, the underlying mechanism can be adapted to self-efficacy and thus to my setting of how self-efficacy might result in foregone participation in a vocational skills training program.[17] The basic idea is that both aspirations and self-efficacy have a bidirectional relationship with behavior. On the one hand, performance in past tasks may feed back into beliefs about future ability. On the other hand, aspirations and self-efficacy can influence individuals' effort, persistence, and investment decisions. This impact can either be positive when aligned with achievable goals, but when misaligned it can also deter individuals from valuable opportunities leading to "aspirational failures", where individuals aim too low and thus invest sub-optimally.[18] The potentially resulting underinvestment results in individuals remaining trapped at low levels of human capital. This expands the classical cost-benefit assessment for investment decisions by a third term, i.e., the "milestone utility" of reaching a certain human capital level relative to an aspired human capital level or, reversed, a loss function for unmet aspirations. Similarly, it expands the traditional idea of a poverty trap caused by initial low endowment levels—here human capital—by another dimension: low aspirational levels.

To formalize this, consider an individual i with initial human capital k_0. To maximize their utility u, they can invest in additional human capital through training t. The decision depends on the direct benefits derived from reaching a final human capital level $b(k)$, the milestone utility $v(\cdot)$ from achieving final human capital level k relative to the aspired human capital level a, and the costs of training participation $c(t)$. This utility function can be described by

$$u(t, a|k_0) = b(k) + v\left(\frac{k-a}{k}\right) - c(t).$$

Moreover, the final human capital is produced by

$$\text{with } k = (1+t)k_0,$$

which generates a complementarity between the investment in training and initial human capital levels. Moreover, I follow Dalton et al. (2016) and assume the following functional forms for the utility components. The direct benefits, $b(k)$, are concave and twice differentiable with $b(0) = 0$, and individuals' risk aversion with respect to changes in human capital $r(k) = kb''(k)/b'(k)$ is smaller than one. This implies that the benefit from marginal increases in investments is

17. A vast literature documents a strong positive correlation between self-efficacy and (educational) aspirations (Ansong et al. 2019; Bandura 1993; Zimmerman 2000; Roy et al. 2018).

18. Easterlin (2001) shows that people do not anticipate that their aspirations grow along with their income, also known as *Easterlin Paradox*.

higher at lower human capital levels. The milestone utility, $v(\cdot)$, is continuously differentiable with $v'(0) > 0$ and fulfills $v'(x) - v''(x)(1-x) \geq 0$ for all feasible values of x. The costs, $c(t)$, are strictly increasing, convex, and continuously differentiable in training participation t with $c(0) = 0$. This ensures that $\partial^2 u(t, a, k_0)/\partial t \partial a \geq 0$ such that aspirations and investments are complements. It further implies that individuals prefer to overachieve rather than underachieve relative to their aspired levels of final human capital.

As shown by Dalton et al. (2016), this model generates the following predictions for the effects of aspirations on training investments. At low initial human capital levels, the costs of investment may outweigh the benefits, irrespective of individuals' aspirations. Similarly, at high levels, individuals will invest regardless of their initial aspirations. However, for individuals with moderate initial human capital levels, aspirations critically influence the decision to invest and the ability to maximize utility. At moderate initial human capital levels, individuals will choose not to invest if they have low(er) aspirational levels, whereas with high(er) aspirational levels they would have chosen to invest.

In Figure 3, I illustrate this in a simplified way by relaxing the concavity and convexity assumptions of Dalton et al. (2016) and instead assuming that utility functions are linear and that investment is a binary decision.[19] The dashed lines indicate the investment decisions of individuals with low (orange) and high (violet) initial aspirations. Individuals will always choose to not invest for $k_0 < k_l$ and to invest for $k_0 > k_h$, irrespective of their aspirations. However, for $k_l \leq k_0 \leq k_h$, the investment decision depends on agents' initial aspirations. While agents with initially low aspirations will not invest (orange dashed line), agents with high aspirations will invest (violet dashed line).

This framework has important implications for what effects one can expect from an intervention that addresses internal, psychological constraints. It shows that the effects of alleviating internal constraints on individuals' investment decisions depend on individuals' initial human capital and the degree of their internal constraints. While for individuals with low or high human capital alleviating internal constraints will not affect their investment decision, it will affect the investment decisions of individuals with moderate human capital levels, if at the same time they face higher internal constraints, i.e., low self-efficacy levels. Individuals with moderate human capital levels that already start with high self-efficacy will also not be affected in their decision.

19. When rational agents choose not to invest, i.e., $t = 0$, the utility function reduces to $b(k)$. When they choose to invest, the utility function is $b(k) - c(t)$. Given the functional form of k the slope is higher for $t \neq 0$. Whenever individuals have misaligned aspirations, their utility line shifts downwards by the unmet milestone utility $\dot{v}()$.

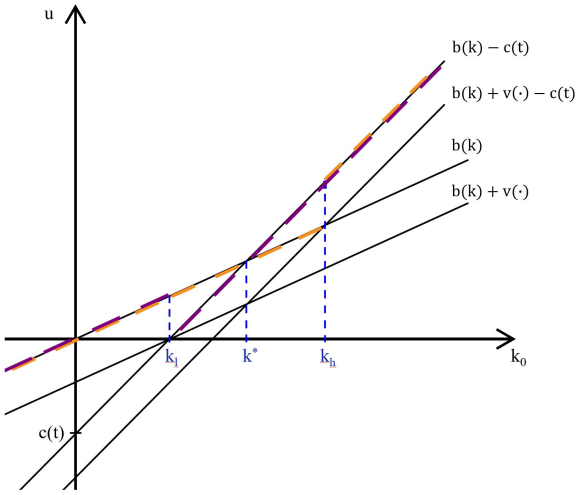


FIGURE 3. Investment decisions.
Note: The graph describes the utility maximization process at different initial human capital levels. The dashed lines indicate the utility maximizing investment decision for individuals who started with low (orange) or with high (violate) aspirations.

5. Effects of the testimonials

5.1. Empirical specification

I estimate the intent-to-treat (ITT) effects of the testimonials on training participation, employment, and quality-of-life outcomes using the following ANCOVA specification:

$$Y_{i,1} = \beta T_i + \gamma Y_{i,0} + \delta_{r(i),o(i)} + \varepsilon_i, \tag{1}$$

where $Y_{i,1}$ is the outcome of individual i at post-intervention time $t = 1$ and T_i is an indicator for whether the individual was assigned to the testimonials on self-efficacy or the control group.[20] I always control for region-occupation fixed effects $\delta_{r(i),o(i)}$ and, when available, the baseline outcome $Y_{i,0}$.[21] For each hypothesis test, I report robust standard errors to account for heteroskedasticity and the p-value from a standard Wald test.[22]

Treatment delivery relies on treated participants receiving the text messages, clicking on the links, watching the videos, and reading the follow-up text messages. In addition, treated participants might have told their peers about the content of the videos and messages, causing

20. Women assigned to the placebo treatment are not considered in the main specification and are later compared to the control group to assess potential reminder effects.

21. The dataset contains a total of seven region-occupation fixed effects. The occupation of Dressmaking was offered in all three regions (Accra, Kumasi, Tamale) and so were the occupations of Beauty therapy and Hairdressing which I grouped into one occupation. Fashion accessories was only trained in Accra. Whether or not the regression includes the baseline outcome, is reported in the bottom row of each regression table.

22. The pre-analysis plan registered clustered standard errors at the location level. However, in the end the training was only implemented in three different regions and across seven different providers. Due to the very limited number of clusters, I use robust standard errors instead.

control participants to also receive the treatment. To address imperfect compliance with treatment assignment, I employ an instrumental variable approach to estimate complier average causal effects (CACE). In the follow-up survey, participants self-reported whether they received messages with video links, watched the videos, and recalled the video content. For the CACE estimations, I instrument whether individuals recall the content with treatment assignment.

I pre-registered the full experiment through the AEA RCT Registry (AEARCTR-0007968), which specified the implementation of the intervention, the outcome categories, potential mechanisms, and the ANCOVA and CACE estimations. I deviate from the pre-analysis plan by excluding women who registered for the N4G program but were not invited to participate due to the reasons outlined in Section 2.3. Additionally, I focus the analysis on the effects of the self-efficacy testimonials and categorize the group that was sent vocational training information as "placebo testimonials". This allows a more targeted analysis of the mechanisms behind the effects of the self-efficacy testimonials.

5.2. Success of testimonial delivery

Table 2 assesses the take-up of the self-efficacy (SE) testimonial campaign. Column (1) examines the effect on the probability of ever clicking on one of the sent video links and column (2) shows the effect on the number of clicks. The number of clicks is tracked automatically by the individualized video links. In addition, self-reported take-up is covered in columns (3) and (4) assessing whether participants indicated that they watched and remembered at least two specific components of the self-efficacy videos, respectively. Columns (5) and (6) focus on the number of follow-up text messages as reported by the participants and recorded in our system, respectively.

The intervention was successfully delivered. Tracking the clicks of the individualized video links shows that 35.0% of the treated women ever clicked on one of the videos. On average, each individualized link was used 0.78 times. Women assigned to the self-efficacy testimonial group are 19.9 percentage points more likely to report having watched the videos, and nearly everyone who reported having watched the videos also recalled the content, even eight months after the last text message was sent.[23] The self-reported take-up of the campaign aligns with other message-based interventions (Bahety et al. 2021). The click-through rate significantly exceeds that of other interventions that delivered videos via text messages (Banerjee et al. 2020). The delivery of the placebo testimonials was equally successful (Appendix Table A.IV.1).

Among the control group, a small share of individuals also indicated having watched the self-efficacy videos (5.4%). The share reduces to 1.7% when looking at those who remembered the content. These shares are small and were anticipated given that some of the study participants

23. Women were asked to freely summarize what they remembered about the videos. Enumerators were provided with a list of correct answer options on their tablets and were trained to select these only if mentioned, without prompting respondents. For women who indicated that they had not watched the videos the variable is coded as zero.

TABLE 2. Effect of treatment assignment on receiving the self-efficacy testimonials.

	Video click		Self-efficacy video		N° of SMS	
	Ever	N°	Watched	Remembered	Self-reported	Sent
	(1)	(2)	(3)	(4)	(5)	(6)
SE (assigned)	0.350***	0.788***	0.199***	0.185***	7.602***	27.711***
	(0.025)	(0.088)	(0.027)	(0.023)	(0.434)	(0.161)
	[0.000]	[0.000]	[0.000]	[0.000]	[0.000]	[0.000]
Observations	747	747	677	677	651	747
Control mean	0.000	0.000	0.054	0.017	0.000	0.000

Note: Results from OLS estimations. The outcome variables indicate if respondents ever clicked on any of the individualized links (column 1), the number of recorded clicks for the individualized links (column 2), if respondents reported to have watched the videos or remembered at least two content components (columns 3 and 4), and self-reported and actual number of received follow-up SMS (columns 5 and 6). Estimations include region-occupation FE. Robust standard errors are displayed in parentheses (* $p < 0.1$, ** $p < 0.05$, *** $p < 0.01$).

knew each other already at the time of registration, some live in the same communities, and some were trained in the same establishments. To assess the potential for spillovers across individuals attending the same training program, I compare the level of treatment saturation within each region-occupation combination to two measures for spillover potential specific to that region-occupation group. First, I calculate the share of individuals assigned to the control or placebo group that indicated having watched or remembering the videos. The left panel of Appendix Figure A.III.4 shows that on average this share is small across all region-occupation groups and does not correlate with the group's treatment saturation. Second, I assume that participants themselves watch each video only a limited number of times. Therefore, I can use the number of recorded clicks within each occupation-region group as a measure for potential spillovers. More specifically, I look at the average number of clicks per link and the 95 percentile of the number of clicks per link. The right panel of Appendix Figure A.III.4 does not show higher number of clicks in region-occupation groups with higher treatment saturation. Moreover, the average number of clicks on the self-efficacy videos exceeds one only in one group. I conclude that the potential for spillover effects is likely limited.

5.3. Effect on self-efficacy

Table 3 presents results for the effect of the testimonial campaign on self-efficacy and other psychological outcomes, measured, on average, six months post-training and eight months after the last text message. Panel A presents OLS estimations reflecting the average treatment effect for women assigned to receive the self-efficacy testimonials. Panel B presents CACE estimates capturing the average treatment effect among women who recalled at least two content components of the self-efficacy videos. For interpretation, I will concentrate on the more conservative OLS estimates, as they address the key challenge of such campaigns: the (mis-)success of reaching the targeted population.

TABLE 3. Effect of the self-efficacy testimonials on psychological outcomes.

	SE index	Mental health				Self-esteem	Conscientiousness
		Index	Anxiety	Depression	Stress		
	(1)	(2)	(3)	(4)	(5)	(6)	(7)
[A] OLS estimations							
SE (assigned)	0.138*	-0.011	-0.024	-0.002	-0.005	-0.012	0.029
	(0.072)	(0.012)	(0.021)	(0.019)	(0.004)	(0.010)	(0.023)
	[0.056]	[0.399]	[0.248]	[0.900]	[0.246]	[0.239]	[0.201]
[B] CACE estimations							
SE (remembered)	0.748*	-0.057	-0.128	-0.013	-0.025	-0.062	0.158
	(0.400)	(0.068)	(0.114)	(0.103)	(0.022)	(0.053)	(0.125)
	[0.062]	[0.407]	[0.263]	[0.900]	[0.251]	[0.238]	[0.207]
1^{st} stage F-stat	65.169	67.123	67.337	67.014	68.596	65.864	65.360
Observations	677	677	677	677	677	677	677
Control mean	-0.010	0.211	0.316	0.260	0.058	0.952	0.845
Baseline outcome	✓	✓	✓	✓	✓	✓	✓

Note: Panel A shows results from OLS estimations. Panel B shows results from CACE estimations using the random treatment assignment as instrument for remembering at least two content components of the videos. The outcome variable in column (1) is standardized with mean zero and standard deviation one, variables in columns (2) to (7) vary between zero and one. Estimations include region-occupation FE. Robust standard errors are displayed in parentheses (* $p < 0.1$, ** $p < 0.05$, *** $p < 0.01$).

The testimonials significantly increased the reported self-efficacy levels, while other psychological outcomes remained unaffected. Column (1) shows that treated women's self-efficacy index is 0.14 standard deviations higher than that of women in the control group.[24] In Appendix Table A.IV.2, I disentangle the self-efficacy index into its separate items. The treatment coefficients are positive for all items, but the self-efficacy testimonials seem to have especially affected women's belief in being able to solve problems. The effect size for the self-efficacy index closely resembles outcomes from other interventions that addressed self-efficacy through intensive in-person interventions. McKelway (2024) reports an effect size of 0.12 standard deviations for an intervention among women in India involving several in-person sessions and a comparable—if anything, shorter—time gap between the intervention and post-treatment outcome measurement.[25] John and Orkin (2022) conducted a two-session intervention with young women in Kenya and report an increase in self-efficacy between 0.11 and 0.15 standard deviations ten weeks later.

The self-efficacy testimonials might have also affected mental health, for example, by helping women better manage stress. I construct a mental health index based on self-reported levels of anxiety, depression, and stress measured based on the validated survey tools for

24. I standardized self-efficacy to have mean zero and a standard deviation of one to allow comparisons to other studies. I standardized self-efficacy across the entire sample and for each wave separately. Therefore, and because of the positive effect of the testimonials on self-efficacy in the treatment group, the mean self-efficacy at endline is negative in the control group.

25. McKelway (2024) measured self-efficacy five weeks, seven weeks, five months, and 13 months after baseline and she pools data across all follow-up surveys. Her intervention finished five-weeks after the baseline.

Generalized Anxiety Disorder 2-item (GAD-2), depressive disorder according to the Patient Health Questionnaire-2 (PHQ-2), and a single item measuring perceived stress. Further, I assess self-esteem and conscientiousness using the Big Five Inventory (BFI-10). Columns (2) through (7) show no significant differences between women assigned to the self-efficacy testimonials and untreated women across any of these dimensions. This suggests that the later observed effects on training participation are unlikely to be driven by broader improvements in psychological well-being, and instead reflect the changes in self-efficacy specifically.

5.4. Effect on training engagement

Next, I present the main results for the effect of the self-efficacy testimonials on individuals' decision to participate in the N4G training. Table 4 reports the results based on women's self-reported participation (columns (1) to (3)) and based on the administrative attendance sheet data (columns (4) to (6)).

Receiving the self-efficacy testimonials reduced the probability of starting the N4G Training by 2.7 percentage points and increased the probability of completing it by 2.4 percentage points. However, neither estimate is statistically significant. These findings hold for both self-reported and administrative measures. In contrast, among women who started the training, the self-efficacy testimonials significantly increased the probability of completing the training by 8.1 percentage points, corresponding to a 10.5% increase relative to the control group mean. The effect is identical across self-reported and administrative data.

I conduct several robustness checks to corroborate the main findings. The results are shown in Appendix Table A.IV.3. First, I evaluate the robustness of the findings to selective attrition. Sample attrition in the follow-up survey is balanced across treatment assignment (Appendix Table A.IV.4) but significantly related to several baseline characteristics (Appendix Table A.IV.5).[26] To account for selective attrition, I apply inverse probability weights and the findings remain unchanged.[27] Second, I investigate whether inference is sensitive to alternative assignments of treatment status. The p-values remain similar when I use the Fisher's permutation-based randomization inference test.[28] Third, I control for additional baseline characteristics selected based on the post-double selection Lasso (PDS Lasso) method (Belloni et al. 2014) and treatment coefficients and significance levels remain unchanged. Lastly, I correct for multiple hypothesis testing using the approaches suggested by Benjamini et al. (2006) to

26. Women who left the sample are younger, more likely to have children, less educated, have lower self-efficacy and higher anxiety levels, more likely to be self-employed, and have higher monthly incomes.

27. I predict participation in the six-months follow-up with treatment assignment and the same individual baseline characteristics as used for the balance checks.

28. I use the Stata command `ritest` with 1,000 replications from Heß (2017).

TABLE 4. Effect of the self-efficacy testimonials on training engagement.

	Self-reported			Attendance sheets		
	Started (1)	Completed (2)	Completed if started (3)	Started (4)	Completed (5)	Completed if started (6)
[A] OLS estimations						
SE (assigned)	-0.027	0.024	0.081**	-0.039	0.017	0.081**
	(0.037)	(0.036)	(0.040)	(0.033)	(0.033)	(0.039)
	[0.463]	[0.501]	[0.043]	[0.227]	[0.599]	[0.036]
Observations	677	677	370	747	747	379
Control mean	0.559	0.433	0.774	0.519	0.384	0.740
[B] CACE estimations						
SE (remembered)	-0.146	0.132	0.365*	-0.213	0.117	0.433**
	(0.201)	(0.196)	(0.186)	(0.187)	(0.187)	(0.208)
	[0.467]	[0.501]	[0.051]	[0.255]	[0.534]	[0.039]
1^{st} stage F-stat	65.998	65.998	47.550	65.998	65.998	41.648
Observations	677	677	370	677	677	361
Control mean	0.559	0.433	0.774	0.547	0.404	0.738

Note: Panel A shows results from OLS estimations. Panel B shows results from CACE estimations using the random treatment assignment as instrument for remembering at least two content components of the videos. All outcome variables are binary. Training start in the admin data equals one if a study participants is listed at least once in the attendance sheets. Columns (3) and (6) reduce the sample to women who started the training. Estimations include region-occupation FEs. Robust standard errors are displayed in parentheses and p-values in squared brackets (* $p < 0.1$, ** $p < 0.05$, *** $p < 0.01$).

control for the false discovery rate. As a result, the coefficient for completion conditional on having started loses its significance.[29]

5.5. Underlying mechanisms

Different mechanisms might explain the observed effect of the self-efficacy testimonials on training completion conditional on start. One potential explanation is that the testimonials affected the composition of women that started the training. At the same time, such a compositional change could introduce sample selection bias of the earlier estimations conditioning on training start. To test such a compositional change, I estimate the extent to which key baseline characteristics predict women's decision to start the training, separately for women who were sent the self-efficacy testimonials and women in the control group. Additionally, I run a third regression using the full sample, and interacting baseline covariates and occupation-region fixed effects with the self-efficacy testimonial treatment status. Table 5 presents the respective coefficients of the covariates of the subsample regressions (columns (1) and (2)) and the coefficients of the interaction terms of the regression in the total sample (column (3)).

Selection into N4G training significantly differs between women who were sent the self-efficacy testimonials and women who were not sent any testimonials, as indicated by the joint significance of the interaction terms (at the 10% level) in column (3). Specifically, the testimonials encouraged

29. Aside the corrections for attrition, these robustness checks were not pre-specified.

Table 5. Predictors of training start among treatment and control.

	Start N4G			Complete N4G if started		
	Self-efficacy		Treatment	Self-efficacy		Treatment
	Treatment	Control	vs. Control	Treatment	Control	vs. Control
	(1)	(2)	(3)	(4)	(5)	(6)
Age	0.011	0.011	-0.000	-0.011	0.002	-0.012
	(0.014)	(0.014)	(0.020)	(0.018)	(0.018)	(0.025)
Married	-0.064	-0.077	0.012	0.067	0.074	-0.007
	(0.060)	(0.056)	(0.082)	(0.063)	(0.062)	(0.089)
Has children	-0.007	-0.013	0.006	0.105	-0.162*	0.267**
	(0.074)	(0.076)	(0.106)	(0.079)	(0.096)	(0.124)
Education: Primary	0.130	-0.040	0.170	0.050	-0.004	0.054
	(0.146)	(0.122)	(0.190)	(0.140)	(0.135)	(0.195)
Education: JHS	0.065	-0.104	0.169	0.174	0.099	0.075
	(0.143)	(0.111)	(0.181)	(0.144)	(0.126)	(0.191)
Education: SHS	0.217	-0.038	0.255	0.178	0.168	0.010
	(0.143)	(0.112)	(0.182)	(0.147)	(0.116)	(0.187)
Self-efficacy index	-0.092	0.421***	-0.513**	0.060	0.212	-0.153
	(0.192)	(0.156)	(0.247)	(0.178)	(0.166)	(0.243)
Depression (PHQ-2)	0.164	-0.226*	0.390**	-0.072	0.015	-0.087
	(0.120)	(0.115)	(0.166)	(0.122)	(0.165)	(0.205)
Stress level	-0.796	0.828	-1.624**	0.829*	0.343	0.486
	(0.629)	(0.527)	(0.820)	(0.472)	(0.701)	(0.846)
Anxiety (GAD-2)	0.024	0.006	0.018	0.199	0.016	0.184
	(0.133)	(0.120)	(0.179)	(0.141)	(0.134)	(0.195)
Employed	0.273*	-0.178	0.452**	-0.184	-0.189	0.005
	(0.146)	(0.140)	(0.203)	(0.159)	(0.155)	(0.222)
Monthly total income (among all)	0.000	-0.001	0.001	0.001	-0.000	0.001
	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)
Weekly total hours (among all)	-0.003	0.005*	-0.008**	0.002	0.005*	-0.002
	(0.003)	(0.003)	(0.004)	(0.003)	(0.003)	(0.004)
Written contract (among all)	0.033	-0.005	0.037	0.068	-0.061	0.128
	(0.208)	(0.182)	(0.276)	(0.066)	(0.324)	(0.332)
Observations	328	349	677	175	195	370
Joint F-stat (p-val)	0.059	0.046	0.060	0.423	0.111	0.675

Note: Results from OLS estimations regressing training start or training completion on baseline characteristics among women who were sent the self-efficacy testimonials (columns 1 and 4), among women who were not sent any testimonials (column 2 and 5), and the total sample for which I also added interactions of baseline characteristics and treatment status. For columns (1), (2), (4), and (5) the joint F-stat refers to a joint significance test across all variables included in the regression (except the occupation-region dummies). In columns (3) and (6), the joint F-stat refers to a joint significance of all interaction terms (except the occupation-region dummies) only. Robust standard errors are displayed in parentheses (* $p < 0.1$, ** $p < 0.05$, *** $p < 0.01$).

training start among women with lower self-efficacy, higher depression, lower stress, and women who were employed but with fewer working hours. Without the testimonials, women with lower baseline self-efficacy were less likely to start the training, supporting the argument that low levels of self-efficacy may act as an internal constraint on human capital investments. Instead, among women who were sent the testimonials, baseline self-efficacy no longer significantly influenced training participation, consistent with the positive effect of the testimonial campaign on self-efficacy and the idea of lifting internal constraints to enable investment decisions.

Although the testimonial campaign did not increase the overall take-up of the N4G training, these results suggest that it induced a compositional change in who started the training. Can the observed increase in training completion (conditional on starting) be attributed to this compositional effect? If this were to be the case, one would expect the women who started the training as a result of the testimonials to also be more likely to complete the training once

enrolled. To test this, columns (4) to (6) of Table 5 replicate the earlier regression but use training completion conditional on training start as the outcome variable. Comparing the results from columns (3) and (5) shows that different baseline characteristics mattered for selection into training versus training completion conditional on training start. This suggests that the observed effects on training completion are unlikely to be driven by compositional changes in who started the training.

Additionally, I test if the effect on completion conditional on start remains robust when controlling for the compositional effect on training start. In two alternative specifications, I either control for women's baseline characteristics or re-balance the sample of women who started the training using entropy weights. In both cases, the positive effect on completion conditional on start remains significant and of very similar magnitude (Table A.IV.6). This suggests that other mechanisms, beyond the compositional effect, drive the increase in training completion among women exposed to the self-efficacy testimonials.

Another mechanism could have been that the testimonials motivated women to participate more actively in the training. To explore this, I examine several performance indicators measured for women who participated in the training. At the end of the N4G training, participants had the opportunity to take the NVTI examination, which provided a nationally accredited certificate for their manual skills. The exam fee was fully covered by the program donor. Additionally, training providers offered job placements to trainees who successfully completed the N4G program. However, both components—the examination and job placements—were limited to a small share of trainees who were the best-performing ones.

In Table 6, I assess the effect of the self-efficacy testimonials on participants' (1) perceived usefulness of the training, (2) participation in the NVTI assessment exam, (3) likelihood of receiving a job placement offer from the training provider, and (4) self-reported manual skills in the registered occupation. The results show that women who were sent the self-efficacy testimonials rated the training as significantly more useful, were significantly more likely to take the NVTI assessment, had a significantly higher probability of receiving a job placement offer, and reported significantly greater manual skills acquisition compared to those who were not sent any testimonials.

So far, the results, together with existing literature showing a strong link between self-efficacy and educational aspirations (Ansong et al. 2019; Bandura 1993; Bandura et al. 2001; Roy et al. 2018), suggest that the higher self-efficacy levels helped women to believe in their ability to successfully complete the training, which materialized in higher completion rates because of better training performance. However, one could argue that the testimonials might have influenced training engagement through a simple reminder effect. Participants received multiple text messages reminding them of the upcoming and ongoing N4G training program, and it is possible that the content of the testimonials did not matter. To test this, I make use of the placebo testimonials. The placebo testimonials reiterated information about the potential benefits of

Table 6. Effect on training outcomes.

	Training usefulness	NVTI certificate	Placement offered	Manual skills
	(1)	(2)	(3)	(4)
[A] OLS estimations				
SE (assigned)	0.445*	0.104**	0.073*	0.510***
	(0.234)	(0.040)	(0.039)	(0.188)
	[0.059]	[0.010]	[0.061]	[0.007]
[B] CACE estimations				
SE (remembered)	2.058*	0.481**	0.336*	2.758***
	(1.159)	(0.197)	(0.184)	(1.067)
	[0.077]	[0.015]	[0.069]	[0.010]
1^{st} stage F-stat	46.979	46.979	46.979	65.998
Observations	377	377	377	677
Control mean	7.576	0.162	0.152	4.735

Note: Panel A shows results from OLS estimations. Panel B shows results from CACE estimations using the random treatment assignment as instrument for remembering at least two content components of the videos. The outcome variables in columns (1) and (4) vary between 0 and 10. The outcome variables in columns (2) and (3) are binary. Estimations include region-occupation FEs. Robust standard errors are displayed in parentheses and p-values in squared brackets (* $p < 0.1$, ** $p < 0.05$, *** $p < 0.01$.

vocational skills training that had already been shared during the N4G registration process. In all other aspects, the placebo testimonials were designed to be as comparable as possible to the self-efficacy testimonials. Both included the same number of videos and follow-up messages, and their delivery was equally successful (Tables 2 and A.IV.1). In line with that, women who were sent the placebo testimonials did not associate higher monetary gains, higher employment probabilities, or higher social status with the completion of vocational training than women who were not sent any testimonials and do not differ in terms of their self-efficacy levels or other psychological outcomes (Appendix Table A.IV.7). If the effects of the self-efficacy testimonials on training engagement were driven solely by the reminder effect of receiving multiple messages, similar outcomes would be expected for women who were sent the placebo testimonials. However, the results show that the placebo testimonials had no significant impact on participation in and completion of the N4G training, either at the extensive or intensive margin (Appendix Table A.IV.8).

To further probe the role of reminder effects, I conduct an alternative specification in which I compare training participation between women who were sent the self-efficacy testimonials and those who were sent the placebo testimonials. This comparison isolates the effect of the testimonial content from the act of receiving repeated messages. While the estimates on training completion continue to be positive, the coefficient on training completion conditional on start decreases in magnitude and I lack power to identify whether the difference is statistically significant (Appendix Table A.IV.9).

Lastly, I assess whether the improved training participation translated into downstream effects on women's employment outcomes and living conditions. The follow-up survey collected information on employment status, job search efforts over the past 12 months, mental health, family situation, and life satisfaction. I find no significant downstream effects on any of these dimensions, except for a marginally significant increase in employment duration. On average, women assigned to the self-efficacy testimonials report 2.6 months longer employment than those in the control group. The absence of broader downstream effects should, however, be interpreted in light of the fact that the N4G training program itself did not produce overall effects on most of these dimensions either, but only for specific occupations.

5.6. Heterogeneous treatment effects

In the preceding analysis, I presented average treatment effects of the self-efficacy testimonials on training participation. However, the theoretical framework suggests that responsiveness to such interventions should vary across individual characteristics, particularly with respect to initial levels of human capital.[30]

To test the framework's predictions, I categorize women into three groups: (1) low if they obtained no formal education or primary education only, (2) medium if they attended junior high school, and (3) high if they attended senior high school. Figure 4 presents ITT estimates along with their 95% confidence intervals when re-estimating the effect of the self-efficacy testimonials on training engagement for each group. The results show that the positive effect on completion (conditional on start) is concentrated among women with medium and, in the case of the administrative data, also among women with low initial educational levels. For women with higher educational levels, the coefficients are close to zero across all outcomes. This pattern aligns closely with the theoretical prediction that internal constraints matter most for individuals with intermediate levels of human capital.

The framework further suggests that interventions targeting internal constraints should primarily affect individuals for whom these constraints can be meaningfully alleviated. In this setting, that includes women with initially low levels of self-efficacy or those who, in the absence of an intervention, would be least likely to complete the training. To explore this, I consider two additional sources of heterogeneity. First, I divide the sample into terciles based on baseline self-efficacy levels. Second, I estimate propensity scores for training completion using the same baseline characteristics employed in the balance tests, restricting the estimation to the control

30. I pre-registered heterogeneity analyses by age, education, self-efficacy, personality traits, employment, economic well-being, economic preferences, living situation, and N4G treatment status. Since the analysis focuses only on women granted access to the N4G program (the N4G treatment group), heterogeneity by N4G treatment status is not applicable. Moreover, fewer than 20% of participants were employed at baseline, limiting the power of subgroup analysis by employment status. Results by individual baseline characteristics that are not discussed in the main text are reported in Appendix V, but show no substantial variation in treatment effects.

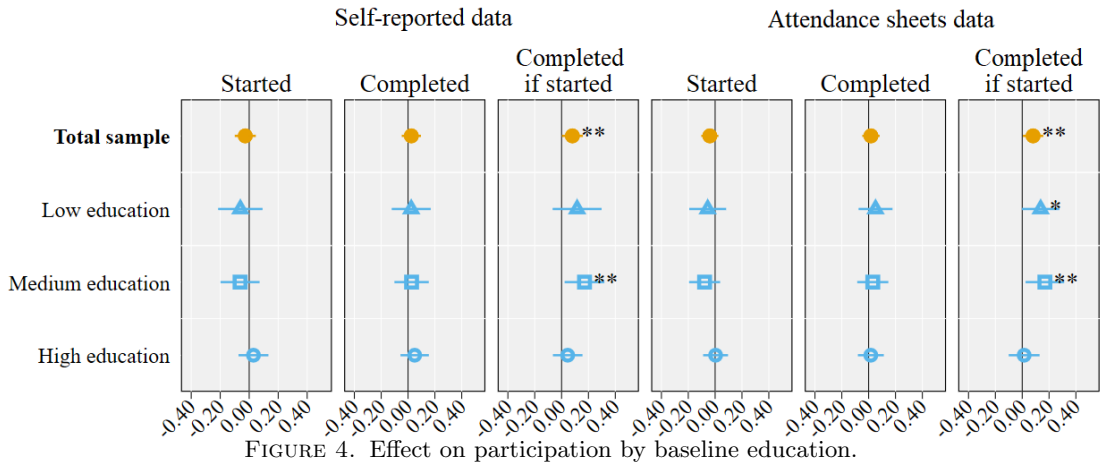


FIGURE 4. Effect on participation by baseline education.

Note: The figure displays the ITT coefficient and 95% confidence interval for the effect of the self-efficacy testimonials on N4G training participation in the total sample (orange) and subsamples generated based on women's baseline educational level (blue). The subgraphs belong to the different outcomes of training participation. Stars indicate the significance level (* $p < 0.1$, ** $p < 0.05$, *** $p < 0.01$).

group and then extrapolate scores to the full sample. Based on these scores, I stratify the sample into terciles of low, medium, and high propensity for training completion.

Results are shown in Figure 5. Consistent with the theoretical framework, the self-efficacy campaign has a positive and statistically significant effect on training completion (conditional on start) only among women with low initial self-efficacy. No significant effects are found for those with medium or high self-efficacy. A similar pattern emerges when stratifying by baseline propensity scores: treatment effects are concentrated among women with low baseline propensity, and for this group, the campaign increases both conditional and unconditional training completion. These effects are also substantially larger in magnitude. In contrast, among women with high baseline propensity, I observe a small reduction in the probability of starting the training.[31]

Lastly, Bertrand et al. (2004) conceptualize internal constraints as common behavioral biases, but that their negative effects can be amplified when combined with external constraints. While the N4G program's eligibility criteria in principle created a relatively homogeneous study sample, women nevertheless differed along several dimensions that likely shaped the degree of external constraints to training participation. To capture this variation, I construct an index based on five baseline characteristics likely to present barriers to training participation: childcare responsibilities, marital or relationship status, English proficiency, household wealth, and reported pre-training concerns.[32] The five dimensions, each represented by a binary indicator, are summed up to an index with higher values indicating greater external constraints. The last two rows of Figure 5 compare treatment effects for women below and above the median of this

31. The distribution of the propensity score is very similar across the treatment and control groups, and results remain identical when excluding the four observations without common support (Figure A.IV.1).

32. Upon registration, women were asked about any concerns related to training participation. The most common concerns referred to transportation costs, although some also mentioned accommodation.

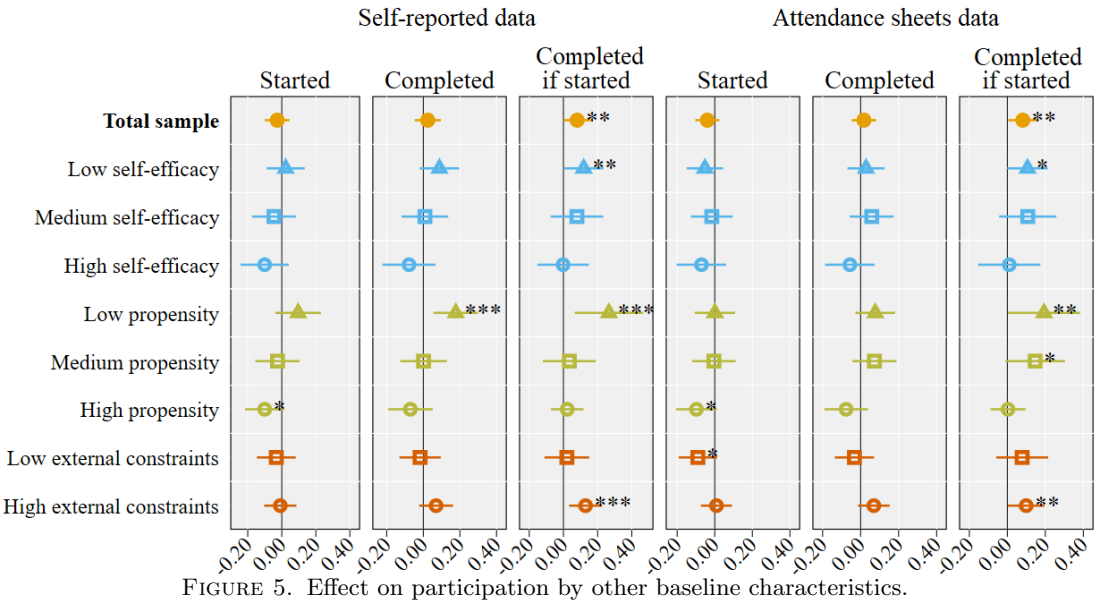


FIGURE 5. Effect on participation by other baseline characteristics.

Note: The figure displays the ITT coefficient and 95% confidence interval for the effect of the self-efficacy testimonials on N4G training participation in the total sample (orange) and in several subsamples generated based on women's baseline characteristics in terms of self-efficacy (blue), propensity for training completion (green), and exposure to external constraints (red). The subgraphs refer to the different indicators of training participation and the different colors represent the different subsamples. Stars indicate the significance level (* $p < 0.1$, ** $p < 0.05$, *** $p < 0.01$).

index. The self-efficacy testimonials increased training completion only for women facing greater external constraints at baseline. This aligns with the idea that alleviating internal constraints is particularly effective under heightened external constraints.

6. Conclusion

In 2021, women aged 16 to 24 from selected communities in the Ghanaian cities of Accra, Kumasi, and Tamale could register for a vocational skills training program. The setting offers an ideal context to examine whether addressing internal constraints can improve training participation as one form of human capital investments. The design of the program minimized traditional external barriers to participation by offering tuition-free training along with monthly stipends for transportation and food. An accompanying rigorous impact evaluation documented significant improvements in job quality and mental health among participants. Mandatory career and counseling sessions at registration helped ensure initial commitment to training—at least at the time of registration. Nevertheless, only 44.2% of the women completed the training. This paper tests whether participation can be improved by raising individuals' self efficacy—an attribute often deficient among young, vulnerable women.

I designed a video- and message-based testimonial campaign featuring women who described how they overcame poverty, societal expectations, and personal fears through resilience, determination, goal-setting, perseverance, and self-belief. A random subset of women registered for the training program was sent these self-efficacy testimonials before and during the training, while others were sent placebo testimonials, or no testimonials at all.

The testimonials successfully increased self-efficacy among treated women, with no measurable changes in other psychological traits. In terms of training engagement, the intervention did not increase overall participation rates but did shift the composition of who started the training. Specifically, women with low baseline self-efficacy were more likely to enroll in response to the testimonials. During the training, the testimonials appear to have supported better performance. Treated women were more likely to rank among the best-performing trainees, reported higher manual skills in their chosen occupation, and rated the training as more useful. These improvements translated into a 10.5% higher probability of completing the training conditional on start, relative to the control group. Notably, the compositional shift in who started the training does not explain this increase in completion.

A theoretical framework of behavioral investment traps helps interpret these findings. It suggests that for individuals with intermediate levels of human capital, self-efficacy plays a critical role in shaping investment decisions. Low levels of self-efficacy can trap individuals in a cycle of underinvestment, even when external constraints are relaxed. In line with this framework, the testimonials' effects were concentrated among women with medium educational levels, low initial self-efficacy, and greater external constraints at the time of registration. Notably, the effects were also concentrated among women with lower predicted completion rates, suggesting that the intervention may have promoted greater equality by disproportionately benefiting those initially at greatest risk of exclusion.

The intervention was both relatively inexpensive and scalable. While the vocational training program required substantial investment, totaling USD 1,348,000 or approximately USD 1,800 per training slot, the testimonial campaign cost just USD 17 per participant including video production, and only USD 3 when considering delivery costs alone. These findings suggest that standard development programs that primarily addressing external constraints, such as human capital development, could substantially benefit from incorporating behavioral interventions that target self-efficacy, an important aspect of potential internal constraints on investment decisions.

Accordingly, I propose that (1) program evaluations should assess both internal and external constraints on individuals' participation, and based on these insights, (2) program designs should be adjusted to jointly address these constraints in order to improve investment decisions. Recent policy developments are promising. For instance, the ILO's *Global Framework on Core Skills for Life and Work in the 21st Century* (ILO 2021) calls for integrating core skills such as self-awareness and problem solving into education and training programs, both of which are foundational to self-efficacy. This framework has already been incorporated into the *Vocational Education and Training Toolbox*, which now informs the designs of development cooperation programs in Belgium, France, Germany, Luxembourg, and the United Kingdom (GIZ 2019). Nonetheless, important implementation questions remain. Could the effect on training start be amplified if a larger share of the intervention were delivered prior to training start? And, which specific content components of testimonial interventions are most effective? Answering these

questions will inform policy makers to refine the design of vocational training programs that not only lower external barriers but also empower individuals to act on opportunities.

References

Adoho, Franck, Shubha Chakravarty, Dala T. Korkoyah, Mattias Lundberg, and Afia Tasneem (2014). *The Impact of an Adolescent Girls Employment Program: The EPAG Project in Liberia*. Policy Research Working Papers, The World Bank, URL http://elibrary.worldbank.org/doi/book/10.1596/1813-9450-6832.

Agarwal, Neha and Subha Mani (forthcoming). "New Evidence on Vocational and Apprenticeship Training Programs in Developing Countries." In *Handbook of Experimental Development Economics*, edited by Utteeyo Dasgupta and Pushkar Maitra. URL https://www.ssrn.com/abstract=4851428.

Alan, Sule and Seda Ertac (2018). "Fostering Patience in the Classroom: Results from Randomized Educational Intervention." *Journal of Political Economy*, 126(5), 1865–1911.

Alan, Sule, Teodora Boneva, and Seda Ertac (2019). "Ever Failed, Try Again, Succeed Better: Results from a Randomized Educational Intervention on Grit." *The Quarterly Journal of Economics*, 134(3), 1121–1162.

Alfonsi, Livia, Oriana Bandiera, Vittorio Bassi, Robin Burgess, Imran Rasul, Munshi Sulaiman, and Anna Vitali (2020). "Tackling Youth Unemployment: Evidence From a Labor Market Experiment in Uganda." *Econometrica*, 88(6), 2369–2414.

Alzúa, María Iaura, Guillermo Cruces, and Carolina Lopez (2016). "Long-Run Effects of Youth Training programs: Experimental Evidence from Argentina." *SSRN Electronic Journal*.

Alzúa, Maria Laura, Soyolmaa Batbekh, Altantsetseg Batchuluun, Bayarmaa Dalkhjav, and José Galdo (2021). "Demand-Driven Youth Training Programs: Experimental Evidence from Mongolia." *The World Bank Economic Review*, 35(3), 720–744.

Ambler, Kate, Kelly Jones, and Michael O'Sullivan (2021). "Facilitating women's access to an economic empowerment initiative: Evidence from Uganda." *World Development*, 138, 105224.

Ansong, David, Sarah R. Eisensmith, Moses Okumu, and Gina A. Chowa (2019). "The importance of self-efficacy and educational aspirations for academic achievement in resource-limited countries: Evidence from Ghana." *Journal of Adolescence*, 70(1), 13–23.

Appadurai, Arjun (2004). "The capacity to aspire." In *Culture and Public Action, The International Bank for Reconstruction and Development*, edited by Vijayendra Rao and Michael Walton, pp. 59–84. Washington, DC: The World Bank.

Attanasio, Orazio, Adriana Kugler, and Costas Meghir (2011). "Subsidizing Vocational Training for Disadvantaged Youth in Colombia: Evidence from a Randomized Trial." *American Economic Journal: Applied Economics*, 3(3), 188–220.

AUC and OECD (2024). *Africa's Development Dynamics 2024: Skills, Jobs and Productivity*. Africa's Development Dynamics, OECD, AUC, Addis Ababa/OECD Publishing, Paris, URL https://www.oecd-ilibrary.org/development/africa-s-development-dynamics-2024_df06c7a4-en.

Azariadis, Costas and Allan Drazen (1990). "Threshold Externalities in Economic Development." *The Quarterly Journal of Economics*, 105(2), 501.

Bahety, Girija, Sebastian Bauhoff, Dev Patel, and James Potter (2021). "Texts don't nudge: An adaptive trial to prevent the spread of COVID-19 in India." *Journal of Development Economics*, 153, 102747.

Baiardi, Anna and Andrea A Naghi (2024). "The value added of machine learning to causal inference: evidence from revisited studies." *The Econometrics Journal*, 27(2), 213–234.

Bandiera, Oriana and Markus Goldstein (2010). "Intentions to Participate in Adolescent Training Programs: Evidence from Uganda." *Journal of the European Economic Association*, 8(2-3), 548–560.

Bandiera, Oriana, Niklas Buehren, Robin Burgess, Markus Goldstein, Selim Gulesci, Imran Rasul, and Munshi Sulaiman (2020). "Women's Empowerment in Action: Evidence from a Randomized Control Trial in Africa." *American Economic Journal: Applied Economics*, 12(1), 210–259.

Bandiera, Oriana, Vittorio Bassi, Robin Burgess, Imran Rasul, Munshi Sulaiman, and Anna Vitali (2023). "The Search for Good Jobs: Evidence from a Six-year Field Experiment in Uganda." *NBER Working*

Paper, 31570.

Bandura, Albert, Claudio Barbaranelli, Gian Vittorio Caprara, and Concetta Pastorelli (2001). "Self-Efficacy Beliefs as Shapers of Children's Aspirations and Career Trajectories." *Child Development*, 72(1), 187–206.

Bandura, Albert (1978). "Self-efficacy: Toward a unifying theory of behavioral change." *Psychological Review*, 84(2), 191–215.

Bandura, Albert (1993). "Perceived Self-Efficacy in Cognitive Development and Functioning." *Educational Psychologist*, 28(2), 117–148.

Bandura, Albert (1997). *Self efficacy: the exercise of control*. W. H. Freeman, New York (N.Y.).

Banerjee, Abhijit V. and Andrew F. Newman (1993). "Occupational Choice and the Process of Development." *Journal of Political Economy*, 101(2), 274–298.

Banerjee, Abhijit, Marcella Alsan, Emily Breza, Arun Chandrasekhar, Abhijit Chowdhury, Esther Duflo, Paul Goldsmith-Pinkham, and Benjamin Olken (2020). "Messages on COVID-19 Prevention in India Increased Symptoms Reporting and Adherence to Preventive Behaviors Among 25 Million Recipients with Similar Effects on Non-recipient Members of Their Communities." Tech. Rep. w27496, National Bureau of Economic Research, Cambridge, MA, URL http://www.nber.org/papers/w27496.pdf.

Banerjee, Abhijit, Amy Finkelstein, Rema Hanna, Benjamin A. Olken, Arianna Ornaghi, and Sudarno Sumarto (2021). "The Challenges of Universal Health Insurance in Developing Countries: Experimental Evidence from Indonesia's National Health Insurance." *American Economic Review*, 111(9), 3035–3063.

Banerjee, Abhijit, Rema Hanna, Benjamin A Olken, and Diana Sverdlin Lisker (2024). "Social Protection in the Developing World." *Journal of Economic Literature*, 62(4), 1349–1421.

Baranov, Victoria, Sonia Bhalotra, Pietro Biroli, and Joanna Maselko (2020). "Maternal Depression, Women's Empowerment, and Parental Investment: Evidence from a Randomized Controlled Trial." *American Economic Review*, 110(3), 824–859.

Barrera-Osorio, Felipe, Adriana Kugler, and Mikko Silliman (2023). "Hard and Soft Skills in Vocational Training: Experimental Evidence from Colombia." *The World Bank Economic Review*, 37(3), 409–436.

Belloni, Alexandre, Victor Chernozhukov, and Christian Hansen (2014). "Inference on Treatment Effects after Selection among High-Dimensional Controls." *The Review of Economic Studies*, (2), 608–650.

Benjamini, Yoav, Abba Krieger, and Daniel Yekutieli (2006). "Adaptive linear step-up false discovery rate controlling procedures." *Biometrika*, 93, 491–507.

Bentaouet Kattan, Raja, Myra Murad Khan, and Melissa Merchant (2023). *Achieving Gender Equality in Education: Examining Progress and Constraints*. World Bank Gender Thematic Policy Notes Series, Washington, DC: World Bank, URL https://hdl.handle.net/10986/40595.

Berg, Gerard J. and Johan Vikström (2022). "Long-Run Effects of Dynamically Assigned Treatments: A New Methodology and an Evaluation of Training Effects on Earnings." *Econometrica*, 90(3), 1337–1354.

Bernard, Tanguy, Stefan Dercon, Kate Orkin, Giulio Schinaia, and Alemayehu Seyoum Taffesse (2023). "The Future in Mind: Aspirations and Long-term Outcomes in Rural Ethiopia." *CSAE Working Paper*, WPS/2023-10.

Bertrand, Marianne, Sendhil Mullainathan, and Eldar Shafir (2004). "A Behavioral-Economics View of Poverty." *American Economic Review*, 94(2), 419–423.

Bhattacharya, Shrayana, Maria Mini Jos, Soumya Kapoor Mehta, and Rinku Murgai (2015). "From Policy to Practice: How Should Social Pensions Be Scaled Up?" *Economic and Political Weekly*, 50(14), 60–67.

Biewen, Martin, Bernd Fitzenberger, Aderonke Osikominu, and Marie Paul (2014). en"The Effectiveness of Public-Sponsored Training Revisited: The Importance of Data and Methodological Choices." *Journal of Labor Economics*, 32(4), 837–897.

Blattman, Christopher, Julian C. Jamison, and Margaret Sheridan (2017). "Reducing Crime and Violence: Experimental Evidence from Cognitive Behavioral Therapy in Liberia." *American Economic Review*,

107(4), 1165–1206.

Bossuroy, Thomas, Markus Goldstein, Bassirou Karimou, Dean Karlan, Harounan Kazianga, William Parienté, Patrick Premand, Catherine C. Thomas, Christopher Udry, Julia Vaillant, and Kelsey A. Wright (2022). "Tackling psychosocial and capital constraints to alleviate poverty." *Nature*, 605(7909), 291–297.

Breiman, Leo (2001). "Random Forests." *Machine Learning*, 45(1), 5–32.

Campos, Francisco, Michael Frese, Markus Goldstein, Leonardo Iacovone, Hillary C Johnson, David McKenzie, and Mona Mensmann (2017). "Teaching personal initiative beats traditional training in boosting small business in West Africa." *Science*, 357(6357), 1287–1290.

Carneiro, Pedro, Emanuela Galasso, and Rita Ginja (2019). "Tackling Social Exclusion: Evidence from Chile." *The Economic Journal*, 129, 172–208.

Carranza, Eliana and David McKenzie (2023). "Reproducibility package for Job Training and Job Search Assistance Policies in Developing Countries." *Policy Research Working Paper*, (10576). Publisher: World Bank.

Carranza, Eliana and David McKenzie (2024). "Job Training and Job Search Assistance Policies in Developing Countries." *Journal of Economic Perspectives*, 38(1), 221–44.

Carruthers, Celeste K. and Thomas Sanford (2018). en"Way station or launching pad? Unpacking the returns to adult technical education." *Journal of Public Economics*, 165, 146–159.

Chakravarty, Shubha, Mattias Lundberg, Plamen Nikolov, and Juliane Zenker (2019). "Vocational training programs and youth labor market outcomes: Evidence from Nepal." *Journal of Development Economics*, 136, 71–110.

Chalfin, Aaron, Oren Danieli, Andrew Hillis, Zubin Jelveh, Michael Luca, Jens Ludwig, and Sendhil Mullainathan (2016). "Productivity and Selection of Human Capital with Machine Learning." *American Economic Review*, 106(5), 124–127.

Cho, Yoonyoung, Davie Kalomba, Ahmed Mushfiq Mobarak, and Victor Orozco (2013). *Gender Differences in the Effects of Vocational Training. Constraints on Women and Drop-Out Behavior*. Policy Research Working Papers 6545, World Bank.

Cortés, Patricia, Jessica Pan, Laura Pilossoph, Ernesto Reuben, and Basit Zafar (2023). "Gender Differences in Job Search and the Earnings Gap: Evidence from the Field and Lab." *The Quarterly Journal of Economics*, 138(4), 2069–2126.

Crépon, Bruno and Patrick Premand (2024). "Direct and Indirect Effects of Subsidized Dual Apprenticeships." *The Review of Economic Studies*.

CTVET (2020). "National Apprenticeship Policy." Tech. rep., CTVET, URL https://ctvet.gov.gh/national-apprenticeship-policy/.

Dadzie, Christabel, Mawuko Fumey, and Suleiman Namara (2020). *Youth Employment Programs in Ghana: Options for Effective Policy Making and Implementation*. International Development in Focus, The World Bank, Washington, DC, URL http://elibrary.worldbank.org/doi/book/10.1596/978-1-4648-1579-9.

Dalton, Patricio S., Sayantan Ghosal, and Anandi Mani (2016). "Poverty and Aspirations Failure." *The Economic Journal*, 126(590), 165–188.

Dasgupta, Partha and Debraj Ray (1986). "Inequality as a Determinant of Malnutrition and Unemployment: Theory." *The Economic Journal*, 96(384), 1011.

Doerr, Annabelle and Rafael Novella (2024). "The long-term effects of job training on labor market and skills outcomes in Chile." *Labour Economics*, 91, 102619.

Dupas, Pascaline and Radhika Jain (2024). "Women Left Behind: Gender Disparities in Utilization of Government Health Insurance in India." *American Economic Review*, 114(10), 3345–85.

Easterlin, Richard A (2001). "Income and Happiness: Towards a Unified Theory." *The Economic Journal*, 111(473), 465–484.

Eden, Dov and Arie Aviram (1993). "Self-efficacy training to speed reemployment: Helping people to help themselves." *Journal of Applied Psychology*, 78(3), 352–360.

Encinas-Martín, Marta and Michelle Cherian (2023). *Gender, Education and Skills: The Persistence of Gender Gaps in Education and Skills*. OECD Skills Studies, OECD Publishing, Paris, URL https://www.oecd-ilibrary.org/education/gender-education-and-skills_34680dd5-en.

Fazio, Maria Victoria, Richard Freund, and Rafael Novella (2025). "Do entrepreneurial skills unlock opportunities for online freelancing? Experimental evidence from El Salvador." *Journal of Development Economics*, 172, 103363.

Finkelstein, Amy and Matthew J Notowidigdo (2019). "Take-Up and Targeting: Experimental Evidence from SNAP." *The Quarterly Journal of Economics*, 134(3), 1505–1556.

Frohnweiler, Sarah, Charles Atanga Adongo, Bernd Beber, Tabea Lakemann, Jan Priebe, and Jann Lay (2024). "Effects of skills training on employment and livelihood outcomes: A randomized controlled trial with young women in Ghana." *Ruhr Economic Papers*, 1095.

Galor, Oded and Joseph Zeira (1993). "Income Distribution and Macroeconomics." *The Review of Economic Studies*, 60(1), 35.

Genicot, Garance and Debraj Ray (2017). "Aspirations and Inequality." *Econometrica*, 85(2), 489–519.

GIZ (2019). "Life skills and work readiness in VET." URL https://vettoolbox.eu/wp-content/uploads/2022/07/Life-skills.pdf.

Hardy, Morgan and Jamie McCasland (2023). "Are Small Firms Labor Constrained? Experimental Evidence from Ghana." *American Economic Journal: Applied Economics*, 15(2), 253–284.

Hardy, Morgan, Isaac Mbiti, Jamie McCasland, and Isabelle Salcher (2019). *The Apprenticeship-to-Work Transition: Experimental Evidence from Ghana*. No. 8851 in World Bank Policy Research Working Paper, World Bank, Washington, DC, URL https://hdl.handle.net/10986/31676.

Hastings, Justine, Christopher Neilson, and Seth Zimmerman (2015). "The Effects of Earnings Disclosure on College Enrollment Decisions." Tech. Rep. w21300, National Bureau of Economic Research, Cambridge, MA, URL http://www.nber.org/papers/w21300.pdf.

Heß, Simon (2017). "Randomization Inference with Stata: A Guide and Software." *The Stata Journal*, 17(3), 630–651.

Hirshleifer, Sarojini, David McKenzie, Rita Almeida, and Cristobal Ridao-Can (2016). "The Impact of Vocational Training for the Unemployed: Experimental Evidence from Turkey." *The Econometrics Journal*, 126(597), 2115–2146.

ILO (2021). *Global framework on core skills for life and work in the 21st century*. [1st ed.] ed., ILO, Geneva. OCLC: 1368719201.

ILO (2022). "Global Employment Trends for Youth 2022: Africa." Tech. rep., International Labour Organization.

Jensen, Robert (2010). "The (Perceived) Returns to Education and the Demand for Schooling *." *Quarterly Journal of Economics*, 125(2), 515–548.

John, Anett and Kate Orkin (2022). "Can Simple Psychological Interventions Increase Preventive Health Investment?" *Journal of the European Economic Association*, 20(3), 1001–1047.

Kluve, Jochen, Susana Puerto, David Robalino, Jose Manuel Romero, Friederike Rother, Jonathan Stöterau, Felix Weidenkaff, and Marc Witte (2017). "Interventions to improve the labour market outcomes of youth: A systematic review of training, entrepreneurship promotion, employment services and subsidized employment interventions." *Campbell Systematic Reviews*, 13(1).

Kluve, Jochen, Susana Puerto, David Robalino, Jose M. Romero, Friederike Rother, Jonathan Stöterau, Felix Weidenkaff, and Marc Witte (2019). "Do youth employment programs improve labor market outcomes? A quantitative review." *World Development*, 114, 237–253.

Knaus, Michael C., Michael Lechner, and Anthony Strittmatter (2022). "Heterogeneous Employment Effects of Job Search Programs." *Journal of Human Resources*, 57(2), 597–636.

La Ferrara, Eliana (2019). "Presidential Address: Aspirations, Social Norms, and Development." *Journal of the European Economic Association*, 17(6), 1687–1722.

Lewis, Oscar (1966). "The Culture of Poverty." *Scientific American*, 215(4), 19–25.

Maitra, Pushkar and Subha Mani (2017). "Learning and earning: Evidence from a randomized evaluation in India." *Labour Economics*, 45, 116–130.

McBride, Linden and Austin Nichols (2015). "Retooling Poverty Targeting Using Out-of-Sample Validation and Machine Learning." *The World Bank Economic Review*, 32(3), 531–550.

McKelway, Madeline (2024). "Women's Self-Efficacy and Economic Outcomes: Evidence from a Two-Stage Experiment in India." Tech. rep., Working Paper.

McKenzie, David and Dario Sansone (2019). "Predicting entrepreneurial success is hard: Evidence from a business plan competition in Nigeria." *Journal of Development Economics*, 141, 102369.

McKenzie, David (2017). "How Effective Are Active Labor Market Policies in Developing Countries? A Critical Review of Recent Evidence." *The World Bank Research Observer*, 32(2), 127–154.

Molina, Teresa and Emiko Usui (2023). "Female labor market conditions and gender gaps in aspirations." *Journal of Economic Behavior & Organization*, 211, 165–187.

Mullainathan, Sendhil and Jann Spiess (2017). "Machine Learning: An Applied Econometric Approach." *Journal of Economic Perspectives*, 31(2), 87–106.

Orkin, Kate, Robert Garlick, Mahreen Mahmud, Richard Sedlmayr, Johannes Haushofer, and Stefan Dercon (2023). "Aspiring to a Better Future: Can a Simple Psychological Intervention Reduce Poverty?" *NBER Working Paper*, 31735.

Osikominu, Aderonke (2013). "Quick Job Entry or Long-Term Human Capital Development? The Dynamic Effects of Alternative Training Schemes." *The Review of Economic Studies*, 80(1), 313–342.

Osman, Adam and Jamin D. Speer (2024). "Stigma and take-up of labour market assistance: Evidence from two field experiments." *Economica*, 91(361), 123–141.

Reuben, Ernesto, Paola Sapienza, and Luigi Zingales (2024). "Overconfidence and Preferences for Competition." *The Journal of Finance*, 79(2), 1087–1121.

Rojas Valdes, Ruben Irvin, Bruce Wydick, and Travis J Lybbert (2022). "Can hope elevate microfinance? Evidence from Oaxaca, Mexico." *Oxford Economic Papers*, 74(1), 236–264.

Roy, Sanchari, Matthew Morton, and Shrayana Bhattacharya (2018). "Hidden human capital: Self-efficacy, aspirations and achievements of adolescent and young women in India." *World Development*, 111, 161–180.

Sansone, Dario (2019). "Beyond Early Warning Indicators: High School Dropout and Machine Learning." *Oxford Bulletin of Economics and Statistics*, 81(2), 456–485.

Schmidpeter, Bernhard and Rudolf Winter-Ebmer (2021). "Automation, unemployment, and the role of labor market training." *European Economic Review*, 137, 103808.

Schwarzer, Ralf and Matthias Jerusalem (1995). "Generalized Self-Efficacy scale." In *Measures in health psychology: A user's portfolio. Causal and control beliefs*, edited by John Weinman, Stephen Wright, and Marie Johnston, pp. 35–37. NFER-NELSON, Windsor, UK.

Sherer, Mark, James E. Maddux, Blaise Mercandante, Steven Prentice-Dunn, Beth Jacobs, and Ronald W. Rogers (1982). "The Self-Efficacy Scale: Construction and Validation." *Psycho- logical Reports*, 51(2), 663–671.

Shonchoy, Abu, Tomoki Fujii, and Selim Raihan (2018). "Barriers to Labor Migration for the Rural Poor: Experimental Evidence from a Vocational Training Program in Bangladesh." *SSRN Electronic Journal*.

Small, Mario Luis, David J. Harding, and Michèle Lamont (2010). "Reconsidering Culture and Poverty." *The ANNALS of the American Academy of Political and Social Science*, 629(1), 6–27.

United Nations, Department of Economic and Social Affairs Sustainable Development (2015). "Transforming our world: the 2030 Agenda for Sustainable Development." URL https://sdgs.un.org/2030agenda.

World Bank, UNESCO, and ILO (2023). *Building Better Formal TVET Systems: Principles and Practice in Low- and Middle-Income Countries*. World Bank, URL http://elibrary.worldbank.org/doi/book/10.1596/40072.

World Bank (2012). "World Development Report 2013: Jobs." Tech. rep., World Bank.

World Bank (2019). "World Development Report 2019: The changing nature of work." Tech. rep., World Bank.

Yamada, Shoko and Christian S. Otchia (2022). "Differential effects of schooling and cognitive and non-cognitive skills on labour market outcomes: The case of the garment industry in Ethiopia." *International Journal of Training and Development*, 26(1), 145–162.

Zimmerman, Marc A. (2000). "Empowerment Theory." In *Handbook of Community Psychology*, edited by Julian Rappaport and Edward Seidman, pp. 43–63. Springer US, Boston, MA, URL http://link.springer.com/10.1007/978-1-4615-4193-6_2.

Make me believe. Self-efficacy and human capital investments among young women in Ghana

Online Appendix

Appendix I. Literature overview

TABLE A.I.1. Evaluation literature on training and social service programs.

Paper	Setting	Sample	Program benefits	Take-up	Complet.
Skills training programs					
Bandiera et al. (2020)	Uganda (2008) Young women Vocational and life skills training	4,888	Employment: + 4.9 ppt Earnings: n/a Having a child: - 3.8 ppt Non-consensual sex: - 5.3 ppt	53%	n/a
Bandiera et al. (2023)	Uganda (2012) Disadvantaged youth Vocational training with matching service	1,431	Employment: + 9.4 ppt*** Formal contract: + 5.9 ppt* Earnings: + 11.0***	68%	61%
Alfonsi et al. (2020)	Uganda (2012) Disadvantaged youth Vocational training	1,714	Emloyment : + 9.0 ppt*** Earnings: + 6.1**	68%	64%
Crépon and Premand (2024)	Côte d'Ivoire (2011) Youth Dual apprenticeship	1,842	Employment: + 1.25 ppt** Earnings: + 15.0***	75%	53%
Frohnweiler et al. (2024)	Ghana (2021) Disadvantaged young women Free vocational training with stipend	1,300	Employment: no signif. effect Formal employment: + 7.4 ppt* Medical benefits: + 4.5 ppt** Earnings: no signif. effect	55%	45%
Hardy and McCasland (2023)	Ghana (2012) Unemployed youth Apprenticeship program	621	Only look at firm-level outcomes	47%	n/a
Hardy et al. (2019)	Ghana (2012) Unemployed youth Apprenticeship program	3,270	Employment: - 2.9 ppt* Earnings: - 0.7**	76%	35%
Maitra and Mani (2017)	India (2010) Low-income women Vocational training	878	Employment: + 6.4 ppt** Earnings: + 23.6**	n/a	56%
Chakravarty et al. (2019)	Nepal (2010) Disadvantaged young adults Vocational training with placement service	4,677	Non-farm employment: + 10.0 ppt*** Earnings: + 4.2**	70%	n/a

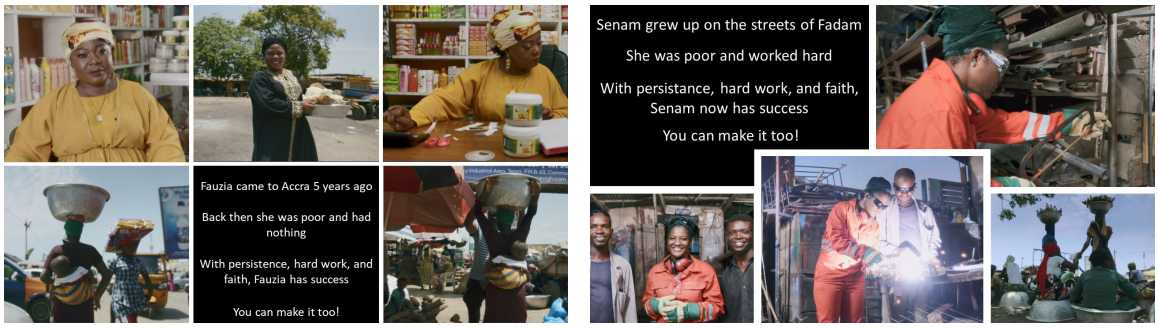
Continued on next page

Table A.I.1 – continued from previous page

Shonchoy et al. (2018)	Bangladesh (2014)	Unemployed low-income youth Vocational training with stipend and internship	2,142	Employment: + 5.6 ppt** Earnings: + 74.8***	60%	45%
Alzúa et al. (2016)	Argentina (2005)	Unemployed low-income youth Vocational and life skills training with internships	407	Employment: no signif. effect Earnings: + 53.0**	66%	48%
Doerr and Novella (2024)	Chile (2012)	Vulnerable indiv. aged 18-65 Job training	4,113	Employment: no signif. effect Earnings: + 25.0 **	67%	n/a
Barrera-Osorio et al. (2023)	Colombia (2018)	Low-income Vocational and social training	663	Employment: + 8 ppt** Formal contract: + 14 ppt Earnings: no signif. effect	81%	60%
Fazio et al. (2025)	El Salvador (2022)	Tertiary educated Job training program for online freelancing	711	Signed contract: + 5.8 ppt** Working hours: no signif. effect	n/a	10%
Hirshleifer et al. (2016)	Turkey (2010)	Unemployed Vocational training	5,497	Employment: no signif. effect Formal employment: + 2.0 ppt* Earnings: no signif. effect	78%	69%
Alzúa et al. (2021)	Mongolia (2003)	Low-income, unemployed, or vulnerable youth Vocational training	1,188	Employment: no signif. effect Self-employment: + 4.0 ppt** Earnings: + 31.9**	57%	n/a
Social service programs						
Banerjee et al. (2021)	Indonesia (2015)	Nonpoor informal workers Full subsidy for government health insurance	4,550	Free universal health coverage HH monthly expenses: USD6	31%	n/a
Bhattacharya et al. (2015)	India (2013)	Elderly, widows and disabled Monthly pension	8,749	Approx. USD25 per month	Widows 16% Elderly 32%	n/a
Carneiro et al. (2019)	Chile (2002)	5% poorest families Child subsidy (Subsidio Único Familiar)	265,987	Approx. USD22 / child & month	53%	n/a

Note: Non-exhaustive list of recently published program evaluations that mentioned take-up and completion rates of training programs and other social service programs. Earnings are always reported in USD per month. Stars indicate the significance levels based on p-values as reported in the studies (* $p < 0.1$, ** $p < 0.05$, *** $p < 0.01$).

Appendix II. Implementation details



(A) Video 1 (B) Video 2

FIGURE A.II.1. Screenshots of the self-efficacy videos.

(A) Video 1 (B) Video 2

FIGURE A.II.2. Screenshots of the placebo videos.

The following are examples of the text messages sent as part of the **self-efficacy testimonials** campaign.

- Hi [NAME]! It is important to set goals in life and work so you stay on track for your journey. Even reaching small goals brings you closer to success!
- Hi [NAME]! Becoming successful is not easy and YOU are doing great! You may fail a few times. Just try to learn from it and continue!
- Hi [NAME]! It is normal to get tense at times. It is a good sign. It means you do something important. You will manage your fear. Don't let it stop you.
- Hi [NAME]! Some people around you had difficult times but now are successful. Ask them and learn how they made it. They have a lot to teach from experience.
- Hi [NAME]! Nobody is perfect. So do not doubt yourself! Focus on your strength and success will come. Always believe in yourself!
- Hi [NAME]! Life is a struggle. Don't dwell about how unfair life can be. You will overcome challenges if you focus on your gifts, talents & take action!

The following are examples of the text messages sent as part of the **placebo testimonials** campaign.

- Hi [NAME]! Do you want to work based on a written contract just as Lydia & Elizabeth? Having a certificate from vocational training will be of great help!
- Hi [NAME]! Bintu & Sylvia are happy with their job from vocational skills training & want to teach you how you can get that too. Click [personalized link].
- Hi [NAME]! The skills and certification you earn from vocational training will stay with you and benefit you for the rest of your life.
- Hi [NAME]! After vocational training Bintu found a fulltime employment with good salary. Click [personalized link] to see how she made it.
- Hi [NAME]! Do you want to follow Bintu's path? Complete a vocational training to find a job and receive a payment that supports your knowledge!
- Hi [NAME]! Would you like to be as happy as Bintu & Sylvia who found their passion after completing their vocational training?

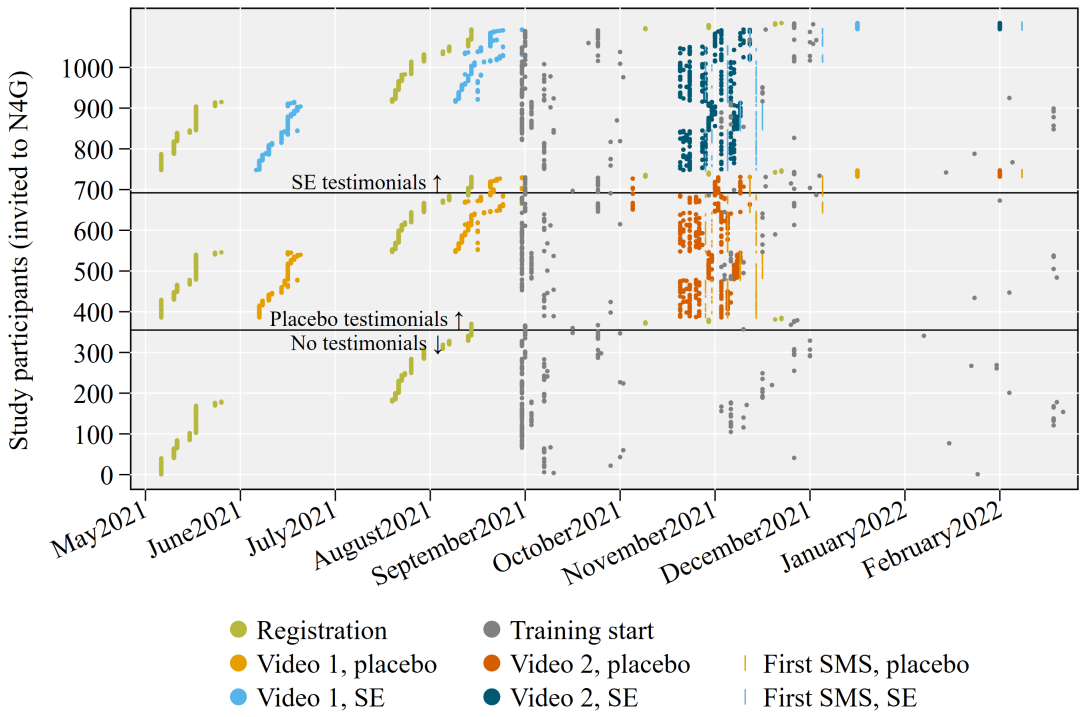


FIGURE A.II.3. Sequence of the testimonial campaign.
Note: The figure shows the timing of the testimonial campaign for all study participants. The y-axis represents the number of study participants and the x-axis the timing of the different events, i.e., the registration for the N4G program, the delivery of the first video, the N4G training start, the delivery of the second video, and the delivery of the first follow-up text message.

Appendix III. Additional descriptive statistics

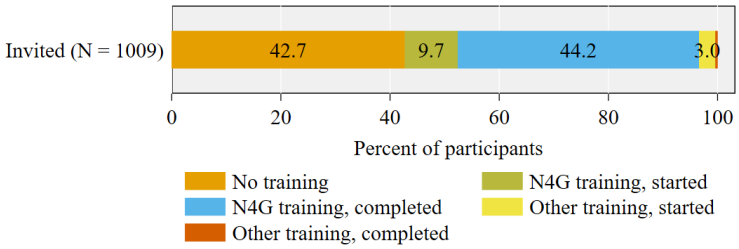


FIGURE A.III.1. Training participation.
Note: The figure shows the share of eligible baseline study participants invited to the N4G training that (i) did not start any training, (ii) started but did not complete the N4G training, (iii) started and completed the N4G training, (iv) started but did not complete another training, (v) started and completed another training, and (vi) were not re-interviewed in the follow-up.

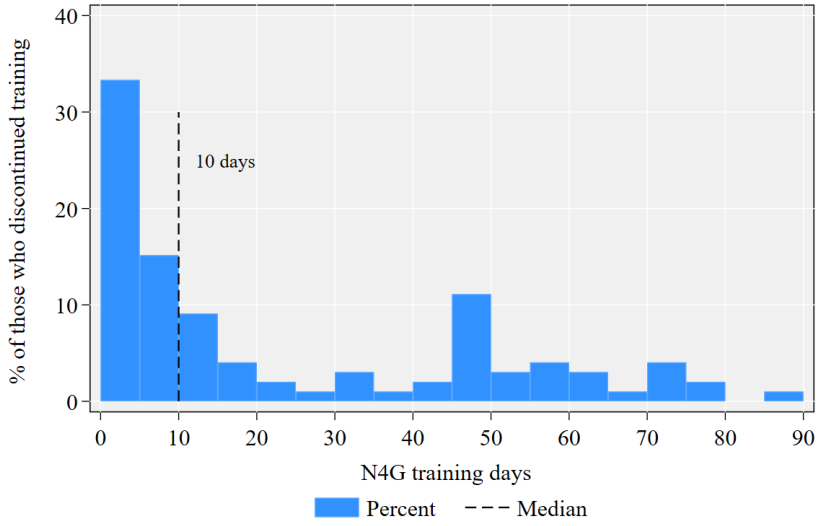
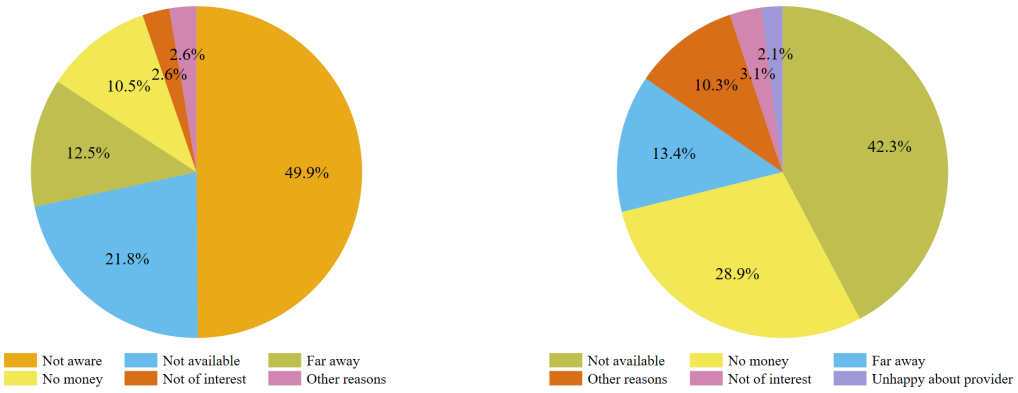


FIGURE A.III.2. Timing of drop-out.
Note: The figure shows how many days participants attended the N4G training before they drop-out among participants that started but did not complete. The dashed line indicates the median. The information is based on the information recorded through the daily attendance sheets of training providers.



(A) Did not start (B) Dropped out

FIGURE A.III.3. Reasons for not starting and dropout.
Note: The figures show the self-reported reasons why study participants (A) did not start and (B) drop out from the N4G training.

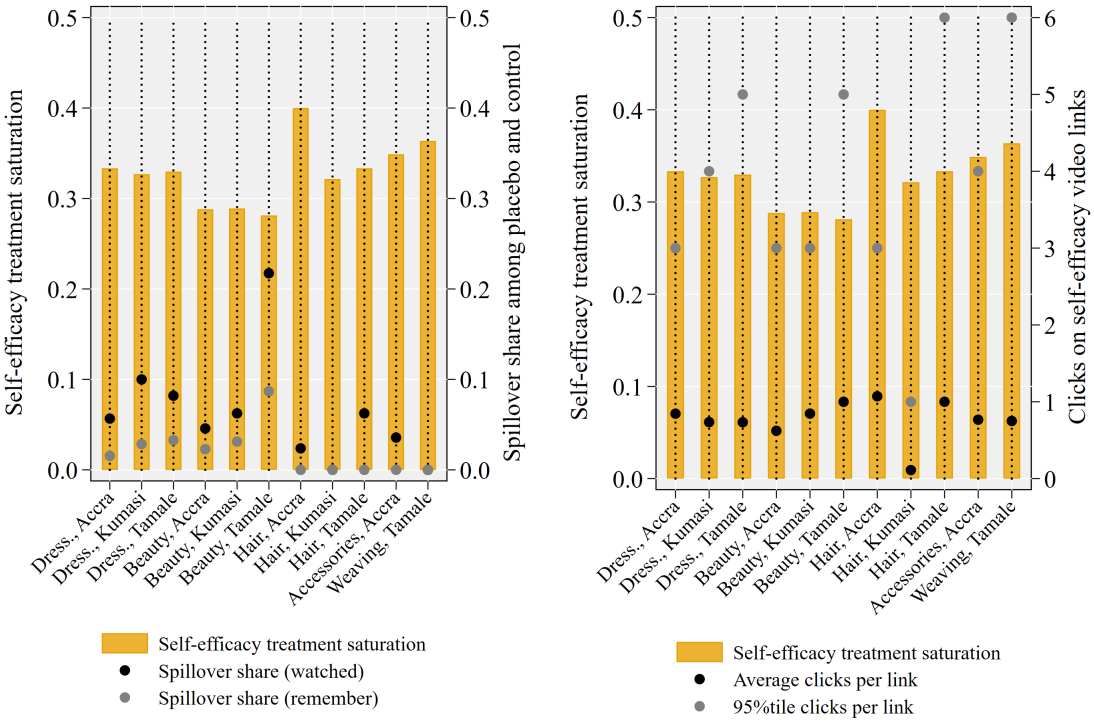


FIGURE A.III.4. Treatment saturation and spillover potential.
Note: The figures show for each region-occupation combination the treatment saturation and potential for spillovers. The bars indicate the treatment saturation measured as the share of women within each region-occupation group that were assigned to the self-efficacy testimonials. The dots indicate the spillover potential measured in four different ways. In the left panel, the dots indicate the share of women who indicated to have watched (black) and remembered the content of the videos (gray) among women assigned to the the control or placebo testimonial group. In the right panel, the spillover potential is proxied by the average number of clicks on each individualized video link in each region-occupation group (black) and the 95 percentile of clicks on each individualized video link in each region-occupation group (gray).

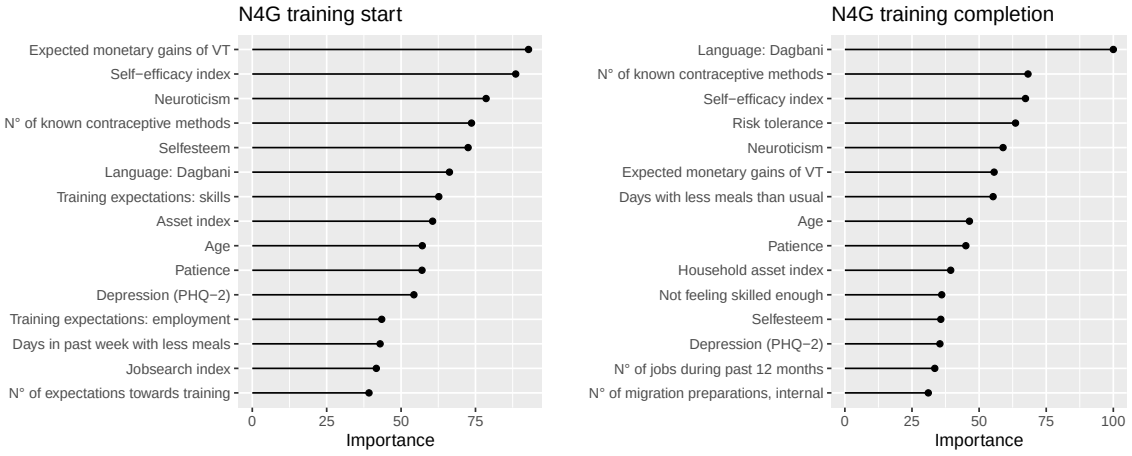


FIGURE A.III.5. Determinants of training participation in control.
Note: The figure shows the relative importance of the 15 most important baseline characteristics of study participants in explaining the decision to start (left) and to complete the N4G training (right) identified through random forest. The sample is reduced to those participants who did not receive any testimonial.

Table A.III.1. Balance check across intervention arms at baseline.

	Self-efficacy (1)	Neutral (2)	Control (3)	Overall (4)	p-value (5)
Socioeconomic characteristics					
Age	20.61	20.52	20.65	20.60	0.65
	(0.11)	(0.11)	(0.11)	(0.06)	
Married	0.40	0.37	0.42	0.39	0.44
	(0.03)	(0.03)	(0.03)	(0.01)	
Has children	0.19	0.19	0.20	0.19	0.89
	(0.02)	(0.02)	(0.02)	(0.01)	
Education: None	0.05	0.04	0.06	0.05	0.44
	(0.01)	(0.01)	(0.01)	(0.01)	
Education: Primary	0.19	0.20	0.15	0.18	0.22
	(0.02)	(0.02)	(0.02)	(0.01)	
Education: JHS	0.30	0.30	0.31	0.30	0.90
	(0.02)	(0.02)	(0.02)	(0.01)	
Education: SHS	0.46	0.46	0.47	0.46	0.92
	(0.03)	(0.03)	(0.03)	(0.01)	
Personality					
Self-efficacy index	0.80	0.81	0.79	0.80	0.15
	(0.01)	(0.01)	(0.01)	(0.00)	
Depression (PHQ-2)	0.24	0.24	0.24	0.24	0.95
	(0.01)	(0.01)	(0.01)	(0.01)	
Stress	0.04	0.04	0.04	0.04	0.39
	(0.00)	(0.00)	(0.00)	(0.00)	
Anxiety (GAD-2)	0.21	0.22	0.23	0.22	0.52
	(0.01)	(0.01)	(0.01)	(0.01)	
Present bias	0.44	0.39	0.39	0.41	0.25
	(0.03)	(0.03)	(0.02)	(0.01)	
Employment characteristics					
Any employment	0.21	0.22	0.22	0.22	0.95
	(0.02)	(0.02)	(0.02)	(0.01)	
Paid employment	0.19	0.19	0.19	0.19	0.96
	(0.02)	(0.02)	(0.02)	(0.01)	
Paid wage-employment	0.12	0.14	0.14	0.13	0.68
	(0.02)	(0.02)	(0.02)	(0.01)	
Paid self-employed	0.07	0.06	0.05	0.06	0.68
	(0.01)	(0.01)	(0.01)	(0.01)	
Monthly total income (among all)	9.10	7.90	8.53	8.51	0.88
	(1.62)	(1.51)	(1.79)	(0.95)	
Weekly total hours (among all)	9.83	11.40	10.58	10.60	0.65
	(1.12)	(1.27)	(1.14)	(0.68)	
Written contract (among all)	0.02	0.03	0.02	0.02	0.29
	(0.01)	(0.01)	(0.01)	(0.00)	
Expected returns to VT	51.87	49.02	45.50	48.73	0.25
	(2.84)	(2.76)	(2.57)	(1.57)	
Distribution across program components					
Region: Accra	0.64	0.62	0.63	0.63	0.86
	(0.03)	(0.03)	(0.02)	(0.01)	
Region: Kumasi	0.17	0.19	0.17	0.18	0.65
	(0.02)	(0.02)	(0.02)	(0.01)	
Region: Tamale	0.19	0.19	0.20	0.19	0.92
	(0.02)	(0.02)	(0.02)	(0.01)	
Trade: Dressmaking	0.49	0.49	0.45	0.48	0.45
	(0.03)	(0.03)	(0.03)	(0.02)	
Trade: Hairdressing	0.13	0.12	0.13	0.13	0.91
	(0.02)	(0.02)	(0.02)	(0.01)	
Trade: Beauty therapy	0.26	0.28	0.33	0.29	0.10
	(0.02)	(0.02)	(0.02)	(0.01)	
Trade: Fashion accessories	0.09	0.09	0.07	0.08	0.52
	(0.02)	(0.01)	(0.01)	(0.01)	
Trade: Yarn weaving	0.02	0.02	0.02	0.02	0.72
	(0.01)	(0.01)	(0.01)	(0.00)	
N	362	362	385	1,109	
Joint F-stat. Self-efficacy					0.699
Joint F-stat. Neutral					0.527

Note: Table shows averages for baseline observations. The p-values belong to a joint orthogonality test on the treatment arms. Values displayed for F-stat are F-statistics for joint significance of all balance variables.

TABLE A.III.2. Determinants of participation

	Training	
	Start	Completion
	(1)	(2)
Age	0.017**	0.016**
	(0.008)	(0.008)
Household asset index	-0.006	-0.026
	(0.081)	(0.082)
Self-efficacy index	0.039**	0.040**
	(0.016)	(0.016)
Risk preferences	0.017***	0.009
	(0.006)	(0.006)
Neuroticism	-0.020	-0.073
	(0.063)	(0.063)
Anxiety (GAD-2)	0.000	0.008
	(0.068)	(0.071)
Depression (PHQ-2)	-0.098	-0.031
	(0.067)	(0.067)
Level of (im)patience	-0.011	-0.012
	(0.008)	(0.008)
Feeling not skilled enough		-0.123**
		(0.060)
N° of job search channels	0.005	0.017
	(0.012)	(0.012)
N° of jobs (12 months)	0.025***	0.015*
	(0.009)	(0.009)
N° of expectations towards N4G	-0.003	-0.001
	(0.013)	(0.013)
Expected returns to VT	0.000*	0.000
	(0.000)	(0.000)
N° of known contraception methods	-0.002	-0.001
	(0.007)	(0.007)
N° of used contraception methods	-0.010	-0.004
	(0.012)	(0.012)
Migration intentions, internal	-0.018	
	(0.013)	
Observations	1,009	1,009
Adj. R^2	0.117	0.114

Note: Results from OLS estimations indicating the determinants of training participation by regressing the outcome variable on the baseline characteristics selected by random forest. In column (1) the outcome variable is N4G training start and N4G training completion in column (2). All estimations include region-occupation FEs. Robust standard errors are displayed in parentheses (* $p < 0.1$, ** $p < 0.05$, *** $p < 0.01$).

Appendix IV. Additional results

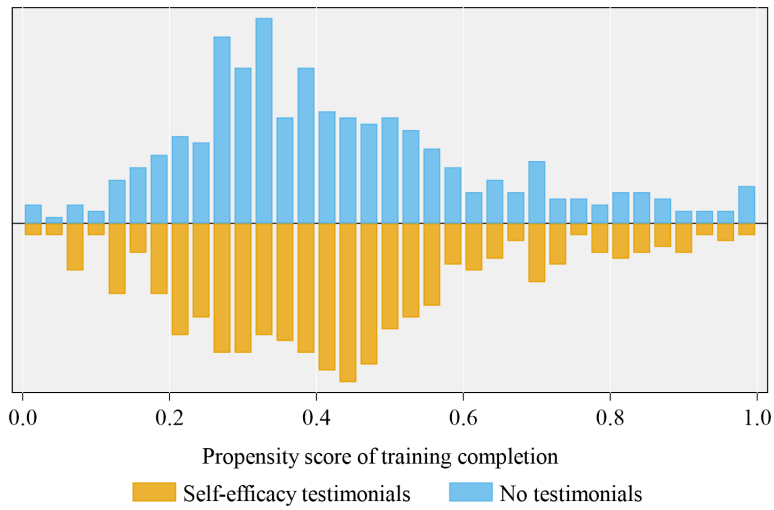


FIGURE A.IV.1. Common support of propensity score of training completion.
Note: The figure displays the distribution of the propensity score of training completion for women who were sent the self-efficacy testimonials (orange) and women who were not sent any testimonials (blue). The propensity score was calculated in the subsample of women who were not sent any testimonials and based on the main baseline characteristics also used for the balance tests.

TABLE A.IV.1. Successful delivery of the placebo testimonials.

	Video clicks		Neutral video		N° of SMS	
	Ever	N°	Watched	Remembered	Self-reported	Sent
	(1)	(2)	(3)	(4)	(5)	(6)
Neutral (assigned)	0.451***	1.414***	0.299***	0.287***	6.370***	27.587***
	(0.026)	(0.135)	(0.029)	(0.027)	(0.383)	(0.179)
	[0.000]	[0.000]	[0.000]	[0.000]	[0.000]	[0.000]
Observations	747	747	681	681	668	747
Control mean	0.000	0.000	0.063	0.032	0.000	0.000

Note: Results from OLS estimations. The outcome variables indicate if respondents ever clicked on any of the individualized links (column 1), the number of recorded clicks for the individualized links (column 2), if respondents reported to have watched the videos or remembered at least two content components (columns 3 and 4), and self-reported and actual number of received follow-up SMS (columns 5 and 6). Estimations include region-occupation FE. Robust standard errors are displayed in parentheses and p-values in squared brackets (* $p < 0.1$, ** $p < 0.05$, *** $p < 0.01$).

TABLE A.IV.2. Effect of the self-efficacy testimonials on separate items of self-efficacy index.

	Separate items of self-efficacy index			
	Problem solving - 1 (1)	Problem solving - 2 (2)	Goal achievement (3)	Unexpected events (4)
[A] OLS estimations				
SE (assigned)	0.051	0.127*	0.092	0.047
	(0.059)	(0.071)	(0.056)	(0.068)
	[0.388]	[0.073]	[0.100]	[0.491]
[B] CACE estimations				
SE (remembered)	0.278	0.683*	0.496	0.255
	(0.317)	(0.391)	(0.314)	(0.370)
	[0.382]	[0.081]	[0.114]	[0.491]
1^{st} stage F-stat	64.468	66.404	66.028	65.785
Observations	676	676	677	677
Control mean	3.480	3.138	3.547	3.209
Baseline outcome	✓	✓	✓	✓

Note: Panel A shows results from OLS estimations. Panel B shows results from IV estimations using the random treatment assignment as instrument for remembering at least two content components of the videos. The outcome variables are the separate index items varying between one and four. Estimations include region-occupation FE. Robust standard errors are displayed in parentheses and p-values in squared brackets (* $p < 0.1$, ** $p < 0.05$, *** $p < 0.01$).

TABLE A.IV.3. Robustness of effects of the self-efficacy testimonials to alternative specifications.

	P-value of SE treatment assignment				
	Model (1)	RI test (2)	IPW (3)	PDS Lasso (4)	BKY (5)
Self-reported data					
Training start	-0.027	-0.027	-0.029	-0.030	-0.027
	[0.463]	[0.481]	[0.427]	[0.408]	[0.664]
Training completion	0.024	0.024	0.026	0.023	0.024
	[0.501]	[0.526]	[0.473]	[0.526]	[0.664]
Training completion among started	0.081	0.081	0.087	0.083	0.081
	[0.043]	[0.042]	[0.034]	[0.034]	[0.147]
Attendance sheets data					
Training start	-0.039	-0.039	-0.034	-0.041	-0.039
	[0.227]	[0.219]	[0.516]	[0.211]	[0.434]
Training completion	0.017	0.017	0.014	0.015	0.017
	[0.599]	[0.592]	[0.762]	[0.645]	[0.664]
Training completion among started	0.081	0.081	0.062	0.073	0.081
	[0.036]	[0.046]	[0.382]	[0.057]	[0.147]

Note: Column (1) reports estimation coefficients and p-values in squared brackets of the main OLS specification. Column (2) reports estimations results when adding the Fisher's permutation-based randomization inference (RI) test with 1,000 replications implemented with `ritest` (Hess, 2017). Column (3) shows estimation results when applying inverse probability weights adjusting for sample attrition. Column (4) additionally controls for PDS-Lasso selected baseline characteristics. Column (5) reports estimation results when controlling for the false discovery rate (Benjamini et al. 2006) and reports q-values in squared brackets. Each regression uses random assignment of the self-efficacy testimonial as explanatory variable and the first column indicates the respective dependent variable. All estimations include region-occupation FEs and robust standard errors.

TABLE A.IV.4. Sample attrition by treatment status.

	Attrition		
	(1)	(2)	(3)
[A] Self-efficacy testimonials			
SE (assigned)	0.000	0.003	0.003
	(0.021)	(0.021)	(0.021)
	[0.984]	[0.870]	[0.870]
[B] Neutral testimonials			
Neutral (assigned)	-0.011	-0.007	-0.007
	(0.021)	(0.021)	(0.021)
	[0.609]	[0.743]	[0.743]
Observations	747	747	747
Control mean	0.094	0.094	0.094
Occupation X Region FE		✓	✓
Baseline controls			✓

Note: Table shows OLS estimation results for the effect of treatment assignment on sample attrition. Panel A shows the results for the assignment of the self-efficacy testimonials and Panel B the results for the assignment of the neutral testimonials. The models of column (2) includes occupation-region FE as controls and column (3) includes occupation-region FE as well as age, marital status, employment situation, education, and household asset index at baseline as controls. Robust standard errors are displayed in parentheses (* $p < 0.1$, ** $p < 0.05$, *** $p < 0.01$).

Table A.IV.5. Sample attrition by baseline characteristics.

	Non-attriters (1)	Attriters (2)	Absolute diff. (3)	p-value (4)
Socioeconomic characteristics				
Age	20.64	20.11	0.53	0.01
	(0.06)	(0.23)	(0.22)	
Married	0.40	0.37	0.03	0.59
	(0.02)	(0.05)	(0.05)	
Has children	0.19	0.27	-0.08	0.05
	(0.01)	(0.04)	(0.04)	
Education: None	0.05	0.10	-0.05	0.02
	(0.01)	(0.03)	(0.02)	
Education: Primary	0.17	0.29	-0.12	0.00
	(0.01)	(0.05)	(0.04)	
Education: JHS	0.30	0.32	-0.02	0.70
	(0.01)	(0.05)	(0.05)	
Education: SHS	0.48	0.29	0.19	0.00
	(0.02)	(0.05)	(0.05)	
Personality				
Self-efficacy index	0.80	0.77	0.03	0.06
	(0.00)	(0.02)	(0.02)	
Depression (PHQ-2)	0.26	0.25	0.01	0.65
	(0.01)	(0.03)	(0.03)	
Stress	0.05	0.05	-0.00	0.79
	(0.00)	(0.01)	(0.01)	
Anxiety (GAD-2)	0.24	0.29	-0.05	0.06
	(0.01)	(0.03)	(0.03)	
Employment characteristics				
Any employment	0.22	0.25	-0.03	0.42
	(0.01)	(0.04)	(0.04)	
Paid employment	0.18	0.24	-0.06	0.18
	(0.01)	(0.04)	(0.04)	
Paid wage-employment	0.13	0.14	-0.01	0.80
	(0.01)	(0.03)	(0.04)	
Paid self-employed	0.05	0.10	-0.05	0.06
	(0.01)	(0.03)	(0.02)	
Monthly total income (among all)	7.22	22.21	-14.99	0.00
	(0.77)	(7.09)	(3.31)	
Weekly total hours (among all)	10.47	11.92	-1.45	0.54
	(0.71)	(2.26)	(2.37)	
Written contract (among all)	0.02	0.03	-0.01	0.50
	(0.00)	(0.02)	(0.01)	
Distribution across program components				
Region: Accra	0.63	0.68	-0.05	0.28
	(0.02)	(0.05)	(0.05)	
Region: Kumasi	0.18	0.18	-0.00	0.91
	(0.01)	(0.04)	(0.04)	
Region: Tamale	0.20	0.14	0.06	0.15
	(0.01)	(0.03)	(0.04)	
Trade: Dressmaking	0.48	0.44	0.04	0.43
	(0.02)	(0.05)	(0.05)	
Trade: Hairdressing	0.12	0.19	-0.07	0.05
	(0.01)	(0.04)	(0.03)	
Trade: Beauty therapy	0.29	0.29	0.00	0.99
	(0.01)	(0.05)	(0.05)	
Trade: Fashion accessories	0.09	0.06	0.03	0.38
	(0.01)	(0.02)	(0.03)	
Trade: Yarn weaving	0.02	0.02	0.00	0.91
	(0.00)	(0.01)	(0.02)	
N	1009	100	1,109	
P-val of joint F-stat.				0.000

Note: Table shows averages for baseline observations. The values displayed for the differences are the differences in means across women who remained in the sample and women who attrited and their respective standard errors in parentheses. The p-values belong to a joint orthogonality test on the two groups. Values displayed for F-stat are F-statistics for joint significance of all balance variables.

TABLE A.IV.6. Effect of the self-efficacy testimonials on training completion conditional on training start - alternative specifications.

	Completed if started			
	Self-reported		Attendance sheets	
	(1)	(2)	(3)	(4)
[A] OLS estimations				
SE (assigned)	0.090**	0.089**	0.083**	0.100**
	(0.040)	(0.041)	(0.040)	(0.040)
	[0.026]	[0.032]	[0.038]	[0.012]
Observations	370	370	379	379
Control mean	0.774	0.774	0.740	0.740
[B] CACE estimations				
SE (remembered)	0.411**	0.399**	0.448**	0.506**
	(0.193)	(0.185)	(0.208)	(0.206)
	[0.034]	[0.032]	[0.032]	[0.015]
1^{st} stage F-stat	46.060	48.210	43.266	44.023
Observations	370	370	361	361
Control mean	0.774	0.778	0.738	0.738
Additional baseline controls	✓		✓	
Entropy weights		✓		✓

Note: Panel A shows results from OLS estimations. Panel B shows results from IV estimations using the random treatment assignment as instrument for remembering at least two content components of the videos. All outcome variables are binary. Estimations include region-occupation FEs. Columns (1) and (3) additionally include individual baseline characteristics as controls. Columns (2) and (4) include entropy weights to rebalance the sample. Robust standard errors are displayed in parentheses and p-values in squared brackets (* $p < 0.1$, ** $p < 0.05$, *** $p < 0.01$).

TABLE A.IV.7. Effect of the placebo testimonials on perceptions and psychological outcomes.

	Benefits of VT		
	Income	Employment	Social status
	(1)	(2)	(3)
[A] OLS estimations			
Neutral (assigned)	1.042	0.011	0.022
	(3.459)	(0.016)	(0.017)
	[0.763]	[0.490]	[0.196]
[B] CACE estimations			
Neutral (remembered)	3.583	0.038	0.076
	(12.023)	(0.055)	(0.059)
	[0.766]	[0.488]	[0.197]
1^{st} stage F-stat	113.561	114.557	114.557
Observations	666	681	681
Control mean	43.371	0.948	0.937
Baseline outcome	✓		

	Psychological outcomes				
	Self-efficacy index	Mental health index	Self-esteem	Conscien-tiousness	Life satisfaction
	(4)	(5)	(6)	(7)	(8)
[A] OLS estimations					
Neutral (assigned)	-0.046	0.002	-0.002	0.030	0.021
	(0.076)	(0.012)	(0.009)	(0.023)	(0.018)
	[0.542]	[0.848]	[0.865]	[0.187]	[0.239]
[B] CACE estimations					
Neutral (remembered)	-0.163	0.008	-0.005	0.105	0.072
	(0.269)	(0.041)	(0.032)	(0.080)	(0.062)
	[0.544]	[0.849]	[0.864]	[0.188]	[0.241]
1^{st} stage F-stat	111.706	114.492	115.128	116.629	114.557
Observations	681	681	681	681	681
Control mean	-0.010	0.211	0.952	0.845	0.516
Baseline outcome	✓	✓	✓	✓	

Note: Panel A shows results from OLS estimations. Panel B shows results from IV estimations using the random treatment assignment as instrument for remembering at least two content components of the videos. In column (1) the outcome is the expected monthly income difference (USD) for having completed vocational training. In columns (2) and (3) the binary outcome variables indicate if individuals agreed to the statement. Ouctomes in columns (4) to (8) vary between zero and one. Estimations include region-occupation FE. Robust standard errors are displayed in parentheses and p-values in squared brackets (* $p < 0.1$, ** $p < 0.05$, *** $p < 0.01$).

Table A.IV.8. Effect of the placebo testimonials on training participation.

	Self-reported			Attendance sheets		
	Started (1)	Completed (2)	Completed if started (3)	Started (4)	Completed (5)	Completed if started (6)
[A] OLS estimations						
Neutral (assigned)	-0.033	0.006	0.056	-0.047	0.001	0.077*
	(0.036)	(0.036)	(0.041)	(0.032)	(0.033)	(0.041)
	[0.368]	[0.877]	[0.172]	[0.143]	[0.966]	[0.059]
Observations	681	681	370	747	747	377
Control mean	0.559	0.433	0.774	0.519	0.384	0.740
[B] CACE estimations						
Neutral (remembered)	-0.114	0.019	0.144	-0.182	0.003	0.233*
	(0.129)	(0.126)	(0.104)	(0.119)	(0.121)	(0.121)
	[0.378]	[0.877]	[0.168]	[0.128]	[0.982]	[0.055]
1^{st} stage F-stat	114.557	114.557	99.310	114.557	114.557	81.641
Observations	681	681	370	681	681	361
Control mean	0.559	0.433	0.774	0.547	0.404	0.738

Note: Panel A shows results from OLS estimations. Panel B shows results from IV estimations using the random treatment assignment as instrument for remembering at least two content components of the videos. All outcome variables are binary. Training start in the admin data equals one if a study participants is listed at least once in the attendance sheets. Columns (3) and (6) reduce the sample to women who started the training. Estimations include region-occupation FEs. Robust standard errors are displayed in parentheses and p-values in squared brackets (* $p < 0.1$, ** $p < 0.05$, *** $p < 0.01$).

Table A.IV.9. Effect of the self-efficacy testimonials on training participation compared to placebo.

	Self-reported			Attendance sheets		
	Started (1)	Completed (2)	Completed if started (3)	Started (4)	Completed (5)	Completed if started (6)
SE (assigned)	0.009	0.023	0.028	0.008	0.014	0.002
	(0.037)	(0.037)	(0.039)	(0.033)	(0.034)	(0.039)
	[0.813]	[0.536]	[0.477]	[0.806]	[0.667]	[0.961]
Observations	660	660	350	724	724	356
Control mean	0.527	0.437	0.829	0.489	0.390	0.797

Note: Results from OLS estimations comparing individuals assigned to the self-efficacy testimonials with individuals assigned to the neutral testimonials. All outcome variables are binary. Training start in the admin data equals one if a study participants is listed at least once in the attendance sheets. Columns (3) and (6) reduce the sample to women who started the training. Estimations include region-occupation FEs. Robust standard errors are displayed in parentheses and p-values in squared brackets (* $p < 0.1$, ** $p < 0.05$, *** $p < 0.01$).

Table A.IV.10. Effect of the self-efficacy testimonials on employment and income.

	Employment				Income
	Any	Paid wage	Paid self	Unpaid	monthly
	(1)	(2)	(3)	(4)	(5)
SE (assigned)	-0.005	-0.028	0.029	-0.010	2.531
	(0.038)	(0.034)	(0.024)	(0.026)	(2.269)
	[0.888]	[0.407]	[0.229]	[0.691]	[0.265]
Observations	677	677	677	677	665
Control mean	0.533	0.289	0.103	0.140	14.428
Baseline outcome	✓	✓	✓	✓	✓

Note: Results from OLS estimations. Outcome variables in columns (1) to (4) are dummy variables. Outcome variable in column (5) is measured in USD. Estimations include region-occupation FEs. Robust standard errors are displayed in parentheses and p-values in squared brackets (* $p < 0.1$, ** $p < 0.05$, *** $p < 0.01$).

Table A.IV.11. Effect of the self-efficacy testimonials on job attributes among employed.

	Hourly income	inc.>0	Weekly hours (1hr)	Tenure (months)	Written contract	Medical benefits	Pension	Paid days off	Job satisf.
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)
SE (assigned)	0.038	0.065	-2.193	2.619*	-0.000	0.042	0.017	-0.065	-0.015
	(0.038)	(0.050)	(2.214)	(1.412)	(0.053)	(0.041)	(0.034)	(0.049)	(0.027)
	[0.311]	[0.195]	[0.323]	[0.065]	[0.996]	[0.311]	[0.614]	[0.190]	[0.582]
Observations	362	258	362	344	278	282	282	282	362
Control mean	0.186	0.256	51.444	10.601	0.273	0.113	0.080	0.253	0.406
Baseline outcome				✓	✓				

Note: Results from OLS estimations. Estimations include region-occupation FEs. Robust standard errors are displayed in parentheses and p-values in squared brackets (* $p < 0.1$, ** $p < 0.05$, *** $p < 0.01$).

Table A.IV.12. Effect of the self-efficacy testimonials on job search.

	Jobsearch	N° of (past 6 months)			
	channels	Employers	Jobs	Interviews	Offers
SE (assigned)	0.111	-0.038	0.194	0.029	-0.128
	(0.095)	(0.120)	(0.160)	(0.077)	(0.098)
	[0.243]	[0.749]	[0.226]	[0.702]	[0.191]
Observations	677	676	675	677	677
Control mean	2.163	0.989	1.310	0.567	0.742
Baseline outcome	✓	✓	✓	✓	✓

Note: Results from OLS estimations. Estimations include region-occupation FEs. Robust standard errors are displayed in parentheses and p-values in squared brackets (* $p < 0.1$, ** $p < 0.05$, *** $p < 0.01$).

Table A.IV.13. Effect of the self-efficacy testimonials on family and financial situation.

	Family			Finances		
	Married	Pregnant	Has children	Bank account	Mobile money	Saving scheme
	(1)	(2)	(3)	(4)	(5)	(6)
SE (assigned)	0.011	-0.003	0.023	0.039	-0.019	0.031
	(0.036)	(0.017)	(0.019)	(0.031)	(0.024)	(0.033)
	[0.765]	[0.857]	[0.235]	[0.216]	[0.430]	[0.347]
Observations	677	677	677	677	677	677
Control mean	0.458	0.052	0.229	0.295	0.854	0.272
Baseline outcome	✓	✓	✓	✓	✓	✓

Note: Results from OLS estimations. Estimations include region-occupation FEs. Robust standard errors are displayed in parentheses and p-values in squared brackets (* $p < 0.1$, ** $p < 0.05$, *** $p < 0.01$).

Appendix V. Additional pre-registered analyses

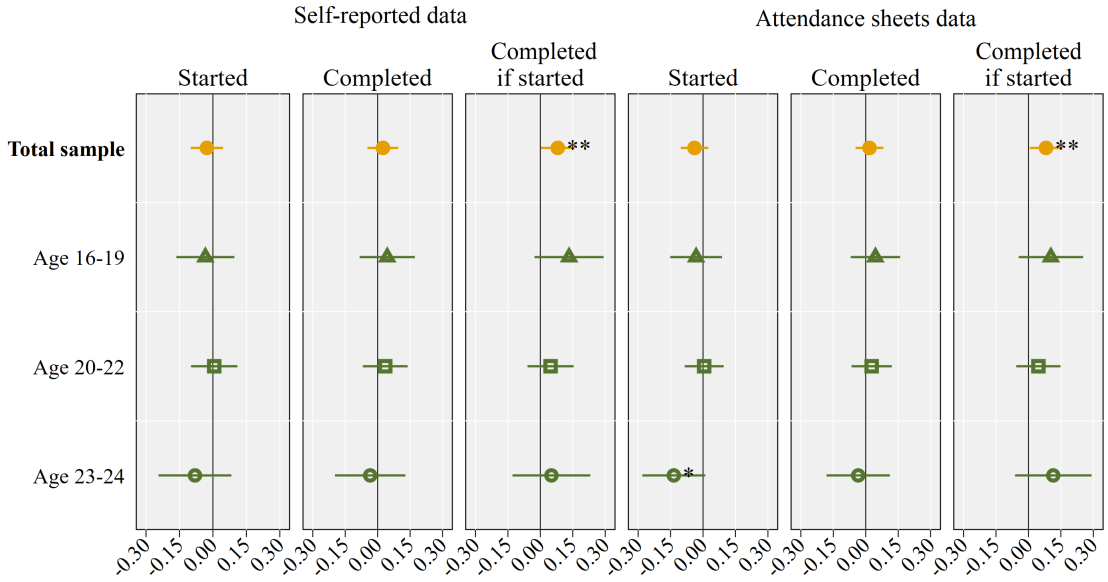


FIGURE A.V.1. Effect on participation by age group.
Note: The figure displays the ITT coefficient and 95% confidence interval for the effect of the self-efficacy testimonials on N4G training participation in the total sample (orange) and in subsamples generated based on women's baseline age (green). The subgraphs refer to the different indicators of training participation and the different colors represent the different subsamples. Stars indicate the significance level (* $p < 0.1$, ** $p < 0.05$, *** $p < 0.01$).

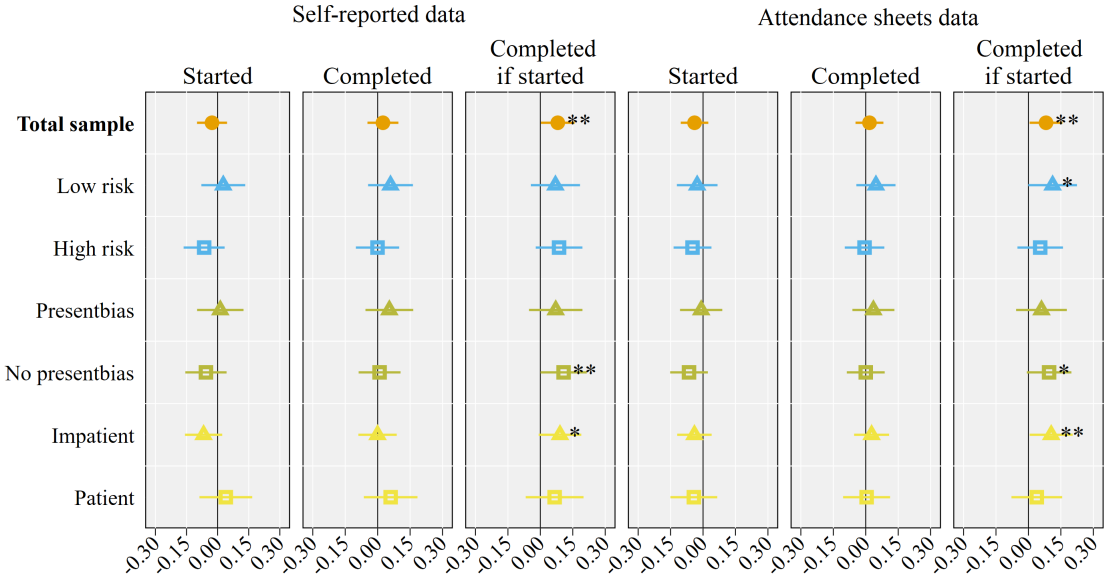


FIGURE A.V.2. Effect on participation by economic preferences.
Note: The figure displays the ITT coefficient and 95% confidence interval for the effect of the self-efficacy testimonials on N4G training participation in the total sample (orange) and in subsamples generated based on women's baseline economic preferences regarding risk (blue), presentbias (green) and patience (yellow). The subgraphs refer to the different indicators of training participation and the different colors represent the different subsamples. Stars indicate the significance level (* $p < 0.1$, ** $p < 0.05$, *** $p < 0.01$).