Discussion paper

Teaching through television: Experimental evidence on entrepreneurship education in Tanzania

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Teaching through television: Experimental evidence on entrepreneurship education in Tanzania [*]

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Abstract

Can television be used to teach and foster entrepreneurship among youth in developing countries? We report from a randomized control field experiment of an edutainment show on entrepreneurship broadcasted over almost three months on national television in Tanzania. The field experiment involved more than two thousand secondary school students, where the treatment group was incentivized to watch the edutainment show. We find short-term evidence of the edutainment show inspiring the viewers to become more interested in entrepreneurship and business and shaping non-cognitive traits such as risk- and time preferences, and long-term evidence of more business startups; in general, the treatment effects are more pronounced for the female viewers. However, we also find evidence that the encouragement of entrepreneurship discouraged investment in schooling;

administrative data show a negative treatment effect on school performance and long-term survey data show that fewer treated students continue schooling.

JEL Codes: O1, I25

1 Introduction

Edutainment shows have a long history in the developed world and are increasingly used in developing countries in order to educate the population in different spheres of life, including health, human rights, and financial literacy.[1] But what are the effects of these shows on the viewers? Do they succeed in becoming a source of knowledge and inspiration and initiating behavioral change, or are they largely pure entertainment? These questions are particularly important in the developing world, where poor quality and severe resource constraints in the educational sector make it pertinent to consider complementary approaches to education (Banerjee and Duflo, 2011).

The present paper reports from a randomized control field experiment studying an edutainment show for entrepreneurship, Ruka Juu ("Jump Up"), which was aired on national television in Tanzania during the spring of 2011. The overall aim of the edutainment show was to educate and motivate Tanzanian youth on entrepreneurship, business skills, and financial literacy in order to realize their potential and enable them to lift themselves out of poverty. The show responded to the great challenge facing the Tanzanian society of creating economic opportunities for a growing young labor force in a country with very little formal employment. Tanzania is one of the poorest countries in the world and 63% of the population are below 25 years.[2] It is estimated that 700 000 - 800 000 youth leave the school system every year looking for ways to earn an income, but only a small fraction obtains formal employment.[3] Self-employment has therefore been promoted by the government of Tanzania in their national development youth policies, but very little training and support have been provided to the youth to enable them to establish and manage small-scale businesses.[4] More widely,

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[1]An edutainment show is typically defined as a program that purposely designs and implements a media message to both entertain and educate, in order to "increase audience knowledge about an educational issue, create favorable attitudes, and change behavior" (Singhal, Cody, Rogers, and Sabido, 2004). For an overview of recent developments in entertainment education, see Singhal (2013).

[2]2012 Population and Housing Census. National Bureau of Statistics, Dar es Salaam, URT, 2013.

[3]Finscope survey Tanzania, 2013 (http://www.fsdt.or.tz/) and World Bank report "Tanzania: Productive jobs wanted", 2014, The World Bank Group.

[4]National Youth Development Policy. Ministry of Labour, Employment and Youth Development, Dar es Salaam, URT, 2007. For a further discussion of the challenges facing youth in Tanzania, see

the fostering of entrepreneurship is perceived to be a critical part of the policy agenda in developing countries to expand employment and earning opportunities and to reduce poverty, particularly for youth and women (Cho and Honorati, forthcoming).

In our study, we randomly selected 43 secondary schools in Dar es Salaam to take part in a field experiment. We used a symmetric encouragement design, where the treatment group was incentivized to watch the edutainment show and the control group was incentivized to watch a weekend movie. To analyze the impact of the edutainment show, we rely on a broad set of data. A few weeks after the end of the show, we conducted an extensive lab experiment to measure impact on ambitions, business knowledge, and entrepreneurial traits such as risk, time and competitiveness preference. Eight months later, at the end of the school year, we collected administrative data on school performance. Further, almost two years after the show ended, we conducted a long-term follow-up survey of a randomized subset of the participants in order to capture the impact of the edutainment show on occupational status, in particular on business startups. Finally, we complemented the quantitative analysis with focus group discussions.

Our study provides three main findings, where the effects are largely more pronounced for the female viewers. First, we find strong evidence of the edutainment show inspiring the viewers in the short term, by increasing their entrepreneurship ambitions and to some extent also strengthening entrepreneurial traits, and, consistent with these short-term effects, we observe that the show caused an increased number of business startups in the long run. Second, we do not find consistent evidence of the edutainment show having an impact on the business knowledge of the viewers. Third, we find that the show in the long term has a negative impact on school performance; fewer participants in the treated group pass the final school exam and continue studying.

The fact that an edutainment show for entrepreneurship caused the students to invest less in education carries a general lesson to the field experimental literature, by showing the importance of taking a broad view of possible implications of a field intervention. It also raises the question of whether it is recommendable to encourage entrepreneurship among youth if this causes them to place less importance on education. We believe that it is crucial to evaluate this finding in light of the present poor quality

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Helgesson (2006). There is also increasing interest in the developed world of targeting the youth with financial education, but the focus is then more on saving and financial decision-making (Lührmann, Serra-Garcia, and Winter, 2012).

of the secondary education in Tanzania.[5] A plausible interpretation of the finding is that the formal education was largely considered irrelevant by some students, while the edutainment show was perceived to present perspectives that were beneficial for their future life situation. It is easy, however, to envision that the encouragement of entrepreneurship may work differently in a society with a high quality formal education, where entrepreneurial ambitions may inspire students to invest more in schooling.

The present paper represents, to our knowledge, the first randomized control field experiment of an edutainment show in a developing country. The study that comes closest to ours is Berg and Zia (2013), who evaluate the impact of incorporating financial messages in a soap opera in South-Africa.[6] They also use a symmetric encouragement design, where the treated group was encouraged to watch a soap opera containing financial messages and the control group was incentivized to watch another soap opera, aired at the same time. In a follow-up study around four months after the show ended, they find evidence of behavioral change, where the treated participants are more likely to borrow from formal sources and less likely to engage in gambling. They find some evidence of increased financial literacy on topics that were prominent in the soap opera, but no effect on general financial literacy. Finally, they do not find any effect on the likelihood to seek financial advice, a topic extensively promoted in the soap opera, and they argue that this may be due to this message being communicated by an external character who failed to connect emotionally with the viewers. The importance of emotional connections is very much in line with the thinking of the designers of Ruka Juu, where a main idea was to introduce real life individuals, rather than soap opera fictional characters, as role models for the viewers. In the focus group discussions, we find strong evidence of the viewers connecting to the life situation and choices of the contestants in the show, which may contribute to explain why we find evidence of behavioral changes almost two years after the show ended.

Our paper also relates to the growing literature studying how TV and radio more

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[5]A recent survey of the educational sector in Tanzania showed huge problems with teacher attendance and the quality of the teaching; see `http://www.theeastafrican.co.ke/news/Spectre-of-poor-quality-education-stalks-Tanzania/`.

[6]Rogers, Vaughan, Swalehe, Rao, Svenkerud, and Sood (1999) is an early study in Tanzania of the effects of using soap opera on the radio to initiate behavioral change. Using a region not reached by the radio broadcast as control, the study finds strong effects of the radio show on family planning. Abdulla (2004) is another early contribution demonstrating the potential of edutainment shows in the context of a public health campaign in Egypt. In a more recent study using qualitative methods, Ramafoko, Andersson, and Weiner (2012) demonstrate how a reality show involving five deprived communities in South Africa targeted social issues like HIV/AIDS, alcohol abuse, and crime.

generally may cause behavioral change. Jensen and Oster (2009) show that the gradual expansion of cable TV in India caused a decrease in the reported acceptability of son preference, domestic violence toward women, and fertility, and La Ferrara, Chong, and Duryea (2012) find that exposure to soap operas in Brazil, which typically depict families with few children, led to a reduction in fertility, particularly among poorer women. In a very different context, Yanagizawa-Drott (2014) shows how a radio station contributed to the Rwandan genocide, by significantly affecting participation in violence and killings. These findings demonstrate the power of television and radio, and our paper complements them by demonstrating that television may also initiate long-term behavioral changes among youth in entrepreneurship and schooling.

Finally, our paper contributes to the literature studying the role of human capital and entrepreneurship training in microenterprise development (McKenzie and Woodruff, 2014). Largely, these studies have looked at whether classroom training of small-scale entrepreneurs may contribute to increased profits and growth of the businesses, but the scalability of such interventions remains an open question (Berge, Bjorvatn, Juniwaty, and Tungodden, 2012; Berge, Bjorvatn, and Tungodden, forthcoming a).[7] Televised edutainment shows for entrepreneurship represent an alternative to classroom training, and the present study demonstrates that such shows can inspire the viewers to become more interested in entrepreneurship and can initiate more business startups, but also suggests that it may be challenging to teach more complex business knowledge through television.

The outline of the paper is as follows: Section 2 provides a discussion of the background for the edutainment show and an overview of the research design; Section 3 discusses sample, balance issues, and the experimental design in more detail; Section 4 studies whether the encouragement design caused increased exposure to the edutainment show among the treated students; Section 5 and Section 6 analyze short-term and long-term effects of the show; Section 7 offers some concluding remarks, while additional analysis is relegated to Appendix A.

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[7]There are also educational classroom field interventions targeting the youth to make them more forward-looking in their behavior, see Alan and Ertac (2015).

2 Background and overview of the research design

We here provide a discussion of the background for the edutainment show and an overview of the research design.

2.1 Background

Ruka Juu is an edutainment show produced by the NGO Femina HIP, which is a multimedia platform working with youth and communities across Tanzania. Femina HIP has since 1999 promoted healthy life styles and gender equality, and in recent years increasingly also entrepreneurship and financial literacy, as well as citizen engagement.[8]

The first season of Ruka Juu was aired on national television in Tanzania from March to May 2011. The edutainment show consisted of 11 weekly episodes built up around six young entrepreneurs (three females and three males). They competed for "the opportunity of their life," to win a prize of 5 million Tsh (around 3100 USD). The contestants, all running their own small-scale businesses, were recruited from semi-urban areas throughout Tanzania with the aim of establishing role models for the viewers. For example, one of the contestants, Benitha, was selected because she had managed to establish her own business despite having dropped out of secondary school due to pregnancy, a common situation for many girls in Tanzania. The audience followed each contestant through a number of challenges engaging both the contestants and the viewers to reflect on how to plan and operate a business. Important topics were market assessment, customer care, marketing, record keeping, credit, savings, insurance, health, and appearance. The edutainment show had a particular focus on female empowerment and one episode was specifically assigned to gender issues. It had an estimated 3.1 million viewers (Tanzania All Media Product Survey) and was awarded the second prize in the 2013 Pan-African Awards for Entrepreneurship in Education, in competition with over 350 initiatives from 33 different countries.

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[8]In addition to Ruka Juu, Femina HIP also produce Fema Magazine, Fema Radio Show, and Fema TV Show. For a further discussion of Ruka Juu, see Ekström and Sekei (2014).

2.2   Overview of the research design

The participants were recruited from 43 randomly selected secondary schools in Dar es Salaam.[9]   The study was introduced as a research project on youth and media. 21 schools were randomly assigned into the treatment group and 22 schools into the control group. At each school and before randomization, one class from the last year of the ordinary level (O-level), also known as Form IV, was selected to participate in the study.

In January 2011, before the first episode of Ruka Juu was aired, we conducted a baseline survey containing questions on socioeconomic background, media-habits, current topics, business issues, and personal ambitions.[10] After the baseline survey was conducted, all students in the selected sample were invited to participate in the study. The students and their parents had to sign a contract where participants promised to watch, to the extent possible, the edutainment show (treatment group) or the week-end movie (control group). The contract also specified that the participants would receive 10 000 Tsh (approximately 7 USD) for participating in the study and that there would be a possibility to earn additional money in a follow-up session after the edutainment show had ended.[11] All participants selected for the study signed the contract, which means that our sample should be representative for the secondary school students in Dar es Salaam.

Midway into the edutainment show we conducted a short survey at all the schools to remind the participants of their contract. We asked them (among other things) to rank their favorite episode (of the edutainment show or the week-end movie), where they normally watched the program, and whether they had missed any episodes.

A few weeks after the edutainment show ended, we conducted an extensive lab experiment at each school to study the short-term impact, where we collected incentivized measures of the participants' knowledge of the content of the edutainment show and the week-end movie, knowledge of business concepts and practices, en-

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[9]We restricted the study to government and community secondary schools, though one private secondary school was included due to an administrative mistake in the list prepared to us by the district education officer. There were 127 government and community secondary schools in Dar es Salaam in 2011 (United Republic of Tanzania: Basic Education Statistics Tanzania 2010). It turned out that two of the schools belonged to the same administrative unit; the results are not sensitive to the removal of these two schools.

[10]A translated version of all supplementary material to the field experiment is provided in Appendix B.

[11]5000 Tsh were paid out when they signed the contract, the remaining 5000 Tsh were paid out when we did the mid-term survey.

trepreneurial ambitions and traits, and social preferences. We also asked a series of non-incentivized questions. The participants were not given any feedback on their performance or earnings during the experiment, and payments were made right after the experiment, in envelopes that ensured privacy.

To study long-term effects, we collected two sets of data. First, we collected administrative data on the participants' performance on the final O-level exam in December 2011; second, we conducted a long-term survey of occupational status, including business start-ups, in 2013.

Finally, to supplement the main analysis, we organized focus group discussions with secondary school students at schools not taking part in the present study. In the focus groups, we received feed-back on how the edutainment show was perceived by the viewers, the extent to which they found it useful, and their views on entrepreneurship and self-employment in general.

To summarize, Table 1 provides a timeline for the research project.

[Table 1 about here.]

The main methodological challenge when designing a field experiment on a nationally broadcasted TV program is to establish a proper control group. We use a symmetric encouragement design, where the treatment group was incentivized to watch the edutainment show and the control group was incentivized to watch the weekend movie.[12] This feature of the design allows us to rule out that the encouragement in itself, in particular the economic incentives offered to the students, can account for the observed treatment effects. We chose the week-end movie for the control group since it was aired at the same time as the edutainment show and it is hard to see that exposure to the weekend movie should have any impact on entrepreneurial variables.

3   Sample, balance and attrition

We here provide a more detailed discussion of the sample, the different data sources, balance, and attrition.

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[12]The weekend movie is a well-established television show in Tanzania, which is supposed to be a family treat that showcases the best movies from Tanzania, see `http://www.eatv.tv/shows/weekend-movie`.

3.1 Baseline: Survey data

We have 2 132 students from 43 schools in this study. In Table 2 we present a set of core variables collected in the baseline survey, and include *p*-values for a test of no mean difference between treatment and control groups.

[Table 2 about here.]

The students are on average 18 years old (16-20 years) and there are slightly more females than males. 25.7% of the students do not live with their parents, and on average they lean towards it being quite easy to find a place to watch television.[13] The majority of the students attend the arts stream in secondary school, while 36.6% attend the business stream which is more practically oriented. At the baseline, we measured their (business) knowledge and (business) ambitions. The knowledge variable is a dummy taking the value one if the student has answered correctly all three questions about the benefit of insurance, how to calculate annual interest on a loan, and how to understand the concept of profit. The ambition variable is a dummy taking the value one if the student has responded that he or she would like to spend a 1 million Tsh gift on starting a business (instead of buying something nice for themselves or their family, paying for education, or spending the money otherwise). We observe that 25.8% of the students answered correctly all three knowledge questions, while 11.6% of the students expressed business ambitions. Finally, we observe that there are on average 49.6 students in each class and that 56.3% of the previous year's students failed at O-level (form IV) exam in 2010, where the high failure rate reflects the poor state of the secondary education in Tanzania.[14]

We observe that the control group scores higher on the knowledge questions, is slightly less likely to live with their parents, and has more male students. In line with the suggestion of Bruhn and McKenzie (2009), we deal with these imbalances by controlling for the baseline characteristics in the subsequent analysis. Further, since the edutainment show had a gender focus, we also study separately the treatment effects for males and females. [15]

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[13]The average, 3.4, is between 3: 'sometimes easy, sometimes difficult' and 4: 'quite easy.' 24.7% do not have a television at home.

[14]At the national level, 70% of the students failed the O-level exam in 2010. The lower failure rate for the schools in the present study largely reflects that these schools are located in the main city of Tanzania.

[15]In Appendix A, we provide additional balance tables. Tables A1-A2 provide balance tables for the baseline sample by gender, Tables A3-A5 provide balance tables for the different subsamples that we

3.2 Short-term: Lab data

The lab experiment was conducted at the schools and we reached 1 915 of the 2 132 students (89.8%). As shown in columns (1)-(4) in Table 3, attrition is higher in the treatment group than in the control group, which effectively means that treated students were less likely to attend school on the day of the experiment. We also observe that attrition is positively associated with business knowledge and business ambitions (as measured in the baseline survey).

[Table 3 about here.]

To study how robust our findings are to attrition, we report nonparametric upper and lower bounds on the treatment effects of interest in Appendix A (Lee, 2009).

3.3 Long-term: Administrative data

We collected administrative data about performance on O-level exams from the National Examinations Council of Tanzania.

To have a baseline measure of school quality, we collected the failure rate in 2010 for all the schools included in this study, as reported in Table 2. The students taking part in the present study took the O-level exam in December 2011, around eight months after the edutainment show ended. Their exam performance thus allows us to study how the edutainment show impacted long-term educational attainment. We managed to collect exam results for 2039 of the 2135 students (95.5%), and as shown in columns (5)-(8) in Table 3, attrition is not correlated with treatment for the long-term administrative data.

3.4 Long-term: Survey data

Finally, to investigate the long-term effect of the edutainment show on occupational status and, in particular, on business start-ups, we conducted an intensive tracking survey of 430 randomly selected participants during the summer of 2013, around two years after the edutainment show had ended and 18 months after the students had finished their Form IV education. The selected sub-sample was identified by randomly

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reached in the different follow-up rounds. In Figure A1 in Appendix A, we provide an overview of the distribution of the share of females across schools. We note that there is one male-only school in the control group. All our results are robust to the removal of this school from the sample.

drawing ten participants from each of the 43 schools. Through an extensive search, we were able to reach and do a phone interview with 286 of the 430 selected participants (66.5%). As shown in columns (9)-(12) in Table 3, attrition is not correlated with treatment for the long-term survey data.

4 Did the encouragement design work?

We first consider whether our encouragement design succeeded in creating an exogenous difference in exposure to the edutainment show between the treatment group and the control group. To study this question, we conducted incentivized tests of the participants' knowledge of the content of the edutainment show as well as of the weekend movies. Each test consisted of ten multiple-choice questions and the participants earned 100 Tsh for each correct answer.

[Table 4 about here.]

From the first two columns in Table 4, we observe that there is a large and statistically significant difference in the number of correct answers on program content between the two groups, with the treatment group clearly knowing more about the edutainment show and less about the weekend movies than the control group. This applies to both females and males. The treatment group had almost two more correct answers on the content of the edutainment show than the control group, which amounts to approximately one standard deviation. The treatment differences in program exposure are confirmed by the last two columns of Table 4, which report regressions on the self-reported number of episodes watched by the treatment group and the control group respectively. The treated students report to have watched significantly more episodes of the edutainment show and significantly fewer episodes of the weekend movies than the control group students.

We observe that the treated participants on average watched 5.7 out of the 11 episodes of the edutainment show. Two main reasons were brought forward for not watching all the episodes. First, the students expressed difficulty in getting access to a television: "You know, if I am sitting alone and grown-ups come and there are two of them and they are interested in soap operas. Then there are two of them against me, and they forcefully take away the freedom you have of watching . . . So I usually just let them be." Second, there were frequent power cuts in Dar es Salaam in the period when

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the edutainment show was broadcasted: "I only watched two episodes because later on we had electricity cut-down problems at our place and I couldn't find another way to watch." The fact that the students had problems fully complying with the contract thus illustrates the challenging learning environment that these students face.

To summarize, we find clear evidence of the encouragement design causing an exogenous difference between the treatment group and the control group in exposure to the edutainment show. We now turn to a discussion of how this affected the participants in the short term and the long term.

5 Short-term impact: Inspiring or educative?

An important aim of the edutainment show was to inspire the viewers to become interested in entrepreneurship and to consider starting their own business. The focus group discussions suggested that the edutainment show succeeded in this respect, as reflected in the following quote by one of the participants: "I can say that Ruka Juu has inspired me to be more determined to succeed and to expand my business. I was thinking if there was a school about business and how to manage it, I would have joined so that I can broaden my knowledge."

In the lab experiment, we included several measures of the participants' interest in entrepreneurship, both incentivised and non-incentivized. The incentivized measure was introduced at the end of the lab experiment, where the participants were given the choice between a participation fee of 4 000 Tsh or participation in two weekend courses on business training. The price of each course was 2 000 Tsh, which would be subtracted from the cash payment at the end of the lab session.[16] 60% of the participants did not sign up for any of the two business courses, while 10% signed up for both courses.

The first column in Table 5 reports from a regression of the willingness to spend 4 000 TSh on further training. We observe that there is a significant effect of the edutainment show on the female participants. The treated female students are almost six percentage points more likely to sign up for the courses, corresponding to 0.22

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[16]The two courses offered were on how to start up and operate a new business (Course 1) and on how to access microfinance and apply for a business loan (Course 2). The participants were told that (i) the courses would be offered by experts, (ii) there would be a limited number of seats, (iii) invitation to attend would be randomly distributed among those who signed up for a course, and (iv) they would be paid back the course fee if they were not selected. In total, 62 participants were offered a business course in the fall of 2011. Our long-term results are robust to the removal of these participants.

of a standard deviation.[17] There is no treatment effect for the male students. In the second and third columns, we report regressions on non-incentivized measures of entrepreneurial ambitions. The second column reports the results for a non-incentivized question on what type of course the participants would take if they were given a free, week-long training course, where we consider the probability of them choosing "training in entrepreneurship."[18] For both male and female participants, there is a strong effect of the edutainment show, with an increase in the probability of choosing entrepreneurship training of almost 0.25 of a standard deviation. We also asked the participants whether they would prefer to start a business of their own over other careers (private sector employee, government employee, farmer) if income and hours were exactly the same across alternatives. We observe from the third column that the treatment group is more likely to report a preference for starting their own business, where this effect is particularly strong and highly significant for the male participants. Finally, in the fourth column of Table 5 we consider the treatment effect on an index combining the three ambition measures. Overall, for both male and female participants, there is a strong treatment effect on the ambition index, which clearly demonstrates that the edutainment show succeeded in inspiring the viewers to become more interested in entrepreneurship and business.

[Table 5 about here.]

A possible mechanism for explaining the increased interest in entrepreneurship and business could be that the edutainment show made the particular kind of small-scale business operated by the contestants more attractive (restaurant, tailor, cosmetic shop, soft drink distributor, hairdresser, electricity supplier). To study this mechanism in more detail, we asked the participants where they saw themselves five years in the future. We asked them to rank 29 different career paths, including non-business career paths (teacher, government office employee, police officer, nurse, student), the career paths of the edutainment show contestants, and other business career paths. Overall, we find suggestive evidence of the contestants being perceived as role models and their career choices being a source of inspiration for the viewers. In particular, we find a borderline significant effect on how the female viewers evaluated the career paths of

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[17]The treatment effect is slightly higher, but less precisely estimated, if we consider the probability that they sign up for at least one of the two courses.

[18]The other alternatives were "training in office work," "training on health issues," "vocational training," and "don't know."

the contestants in the edutainment show (0.089 standard deviations, $p = 0.106$), but no statistically significant on other business career paths (0.041 standard deviation, $p = 0.356$). Treated male viewers, on the other hand, evaluated both categories more positively (0.105 and 0.129 standard deviation, $p = 0.019$ and $p = 0.018$). We do not observe any effect on how the treated students evaluated the non-business career paths (males: -0.028, standard deviation $p = 0.557$, females: 0.01 standard deviation, $p = 0.858$).[19]

The edutainment show also aimed at educating the participants, by providing them with business knowledge and by focussing on the importance of having an entrepreneurial mindset. With respect to business knowledge, the edutainment show provided factual information, introduced key business concepts, and highlighted good business practices with respect to, among other things, marketing, customer care, and record keeping. In order to measure the impact of the edutainment show on business knowledge, the participants answered a set of 24 incentivised multiple-choice questions on macroeconomic facts, business facts, business concepts, and business practices, where the participants were paid 100 Tsh for each correct answer. The questions had been covered in the edutainment show and were developed in collaboration with the producers of the show as well as experts from the University of Dar es Salaam Entrepreneurship Centre, who had been involved in its design and implementation. To illustrate, one question on key business concepts was: "What is profit?" The four answers the participants had to choose among were: A: "Profit is sales of the most important products."; B: "Profit is sales minus the cost of goods and operating expenses."; C: "Profit is sales minus cost of goods and what you take home from the business." D: "Profit is sales plus cost of goods and operating expenses."[20]

Table 6 reports regressions on the number of correct answers to the four subindicies of questions as well as the total number of correct answers. We do not find a systematic treatment effect of the edutainment show on the incentivized test on business knowledge in the lab. We observe that there is a statistically significant positive treatment

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[19]We asked the participants to rank each of the career paths on a scale from 1 (very unlikely) to 5 (very likely). The *p*-values are from separate regressions for each of the three categories of career paths, where the dependent variable is the average score given by an individual to all career paths in the relevant category; otherwise, the regressions are specified as in tables 4-7.

[20] Questions illustrating the other categories are: "How many percent of Tanzanians have a bank account?"(Macro facts); "When do you have to prepare a financial statement for tax estimation?" (Business facts); and "Which of the following is an important part of customer service?" (Business practices). See Appendix B for a complete list of the business knowledge questions.

effect on the knowledge about macroeconomic facts among the male viewers, but also that there is a statistically significant negative treatment effect on the understanding of business concepts among the female viewers. Otherwise, we do not observe any statistically significant effects. The overall impression from the business knowledge test is therefore that the edutainment show largely did not succeed in transferring business knowledge to the viewers. This impression is to some extent confirmed by the focus group discussions, which revealed that the viewers did not remember much of the factual information covered by the edutainment show. Participants in the focus groups mostly did not even remember that there had been any fact sheets displayed on the television screen, despite them appearing in every episode of the edutainment show. Moreover, the episodes covering classroom training led by facilitators from the University of Dar es Salaam and a guest speaker from Tanzania Revenue Authority were hardly mentioned at all by the focus group participants.

The focus group discussions did, however, reveal that some viewers felt that they had gained knowledge about business practices from observing the participants, particularly with respect to customer service: "I learnt to be attentive to the customers and listen to their needs, and not to shout at the customers but have a good language and general cleanliness in the business environment." We can therefore not rule out that the edutainment show transmitted some business knowledge to the viewers, not captured by our test.

[Table 6 about here.]

The edutainment show also conveyed the importance of having an entrepreneurial mindset, including patience and the willingness to take risks.[21] This was reflected in the focus group discussions where viewers expressed admiration for the risk-taking behavior of the contestants: "I liked the entrepreneur, the one with the cosmetics shop. I liked the way she handled the situation when the goods were stolen, she accepted the situation and moved on. She didn't panic although she had incurred a loss because

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[21]Which traits are essential for becoming a successful entrepreneur is still a major research question, and the answer will most likely vary across different types of business environments and cultures. There is some evidence, though, suggesting that the willingness to take risk is an important determinant of the decision to become self-employed in various environments, see for example (Dohmen, Falk, Huffman, Sunde, Schupp, and Wagner, 2011; Hvide and Panos, 2013; Berge, Pires, Bjorvatn, and Tungodden, forthcoming b), and there is evidence suggesting that poverty may cause risk-averse and short-sighted decision-making (Haushofer and Fehr, 2014). The focus of the present edutainment show on risk-taking and patience was largely based on advice from the experts from the University of Dar es Salaam Entrepreneurship Centre, who have worked with the local business community for years.

as an entrepreneur one has to realize that one is investing and that there are risks in the process." Viewers also expressed that they had been impressed by the contestants' willingness to save and to take a long-term perspective.

To study whether the edutainment show had made the viewers adopt a more entrepreneurial mindset, we conducted a series of incentivized tests in the lab to elicit risk, time, and competitiveness preferences.[22] To elicit risk preferences, we asked the participants in the lab to choose between a safe alternative and a risky alternative in three different situations, where one of the situations was randomly selected to determine the payment from this part of the experiment. The payoffs were the same for all three situations; in the safe option 2 000 Tsh, and in the risky option 4 000 Tsh if lucky and zero if unlucky. The only difference between the situations was the probability of the lucky outcome in the risky option (25%, 50%, 75%). From Table 7, we observe that watching the edutainment show significantly increases the female viewers' willingness to take risk, about 0.2 standard deviation, while we do not observe any effect on the males.[23] One possible explanation for the female-specific effect on risk preferences may be that the edutainment show had an effect on the viewers' perceptions of females as risk takers, which then shaped the female viewers' willingness to take risk. In fact, when we asked the participants in the lab what they considered the most common characteristic of Tanzanian business women, a significantly larger share of both males and females in the treatment group chose "Risk taker" (males, $p = 0.004$; females, $p = 0.002$).[24] It thus appears that the edutainment show shaped perceptions about females as risk takers, and, ultimately, also the female viewers' risk preferences.

[Table 7 about here.]

To analyze the impact on time preferences, we asked the participants to make choices in two sets of situations. In the first set of situations, the participants chose between receiving 1 000 Tsh today and a larger amount of money after eight weeks.

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[22]We also conducted incentivised tests of their social preferences, to see whether the edutainment show and the focus on entrepreneurship and business made the participants more selfish or meritocratic (Cappelen, Drange Hole, Sørensen, and Tungodden, 2007; Almås, Cappelen, Sørensen, and Tungodden, 2010; Cappelen, Sørensen, and Tungodden, 2010). As shown in Table A14 in Appendix A, we do not find any impact of the show on the social preferences.

[23]In the main analysis, we take the number of times they chose the risky option as a measure of a participant's willingness to take risk. In Figure A2, we show that the reported result is robust to alternative definitions of risky behavior.

[24]The alternative characteristics were "Fast in decision making", "Good at collaborating", and "Never give up".

They made this choice in three situations where the amount of money received at the later dates varied (1 500, 3 000, and 5 000 Tsh). In the second set of situations, they made the same three choices, but now between money in eight weeks or money in sixteen weeks. For each of the two sets of situations, one situation was randomly drawn to determine the payment from this part of the experiment. We observe from Table 7 that the same gender specific pattern emerges as for risk preferences, the edutainment show has a positive effect (but not statistically significant) on the female viewers, but no effect on the male viewers.[25]

In measuring competition preferences, we followed the approach of Niederle and Vesterlund (2007). The participants were first asked to add up numbers for three minutes, where they received 200 Tsh per correct answer. They were then asked about their beliefs about how well they performed compared to the others in the session. Finally, they were told to do another round of adding up numbers, but this time could choose between a fixed payment of 100 Tsh per correct answer or a payment of 300 Tsh per correct answer if they performed as least as well as the average in the previous round in their session, and zero if they performed worse than the average. As shown in the third column of Table 7, we do not find any treatment effect on the willingness to compete, neither for males nor females.[26]

Finally, we report treatment effects for the mind-set index in Table 7, which combines the three mind-set dimensions. We observe a positive (but not statistically significant effect) for females, which reflects that the edutainment show shaped their risk and time preferences, but did not have any effect on the competitiveness preferences. For the males, we observe no effect on the mind-set index, consistent with the absence of an effect on any of the separate mind-set variables.

In sum, the results from the lab experiment and focus group discussion show that the edutainment show in the short run had a significant positive effect on the entrepreneurship ambitions, but weaker and less systematic effects on the knowledge and mind-set of the viewers.

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[25]In the main analysis, we take the number of times they chose the later payment date as a measure of their patience. The participants were on average more patient when choosing payments in the future ($p < 0.01$), but we obtain very similar estimates of treatment effects if we run separate regressions for the two sets of situations. In Figure A3, we show that we get statistically significant treatment effects on patience if we define patience as choosing the later payment date at least five times.

[26]There was also no statistically significant difference between the treatment group and the control group in beliefs about own performance (males, $p = 0.82$; females, $p = 0.39$).

6 Long-term impact on behavior

We now turn to a discussion of the impact of the edutainment show on long-term behavior, both with respect to school performance and occupational status, including business startups.

We observed that the edutainment show made more students have entrepreneurship ambitions in the short-run. This increased interest in entrepreneurship could make them put more effort into school work, if they perceived the school activities or school performance to be important in order to succeed in business. But the edutainment show might also cause a substitution away from school work, if the schooling is seen as irrelevant for business and the students find it more beneficial to spend time exploring business opportunities. To study the long-term effect of increased entrepreneurship ambitions on school performance, we collected administrative data on whether the students passed the O-level exam, which they took around eight months after the edutainment show ended.

Strikingly, we observe from Figure 1 that the treatment group performed significantly worse in the school exam than the control group; the fraction that passed the O-level exam is significantly lower in the treatment group than in the control group (males: 51.9% versus 64.3%, $p = 0.15$; females: 44.2 versus 66.9, $p = 0.001$).[27] This finding suggests that the increased focus on entrepreneurship as a possible career path made the students less motivated to study hard at school.

The attrition analysis in Table 3 sheds further light on how the edutainment show affected the students' investment in schooling, since attrition at the lab experiment is equivalent to not attending school on the day of the research visit.[28] We observe from Table 3 that the edutainment show had a negative treatment effect on school attendance, which suggests that increased entrepreneurial focus made the students less interested in school activities. Further, we note from Table 3 that there is a significant negative association between business ambitions at baseline and school attendance; students that stated that they would use 1 million Tsh to start a business are seven percentage points less likely to attend school. This suggests that students do not consider schooling to be particularly relevant for business. Overall, our analysis shows that the

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[27]For the long-term results, the corresponding regression analysis is presented in Table A17.

[28]It appears very unlikely that anyone would refrain from attending school that day to avoid taking part in the lab experiment. First, the date of the lab experiment was not announced to the students in advance. Second, the lab experiment represented a possibility for earning money, which made it attractive for the students to take part in it.

edutainment show affected school performance negatively, by making them less motivated for school and thereby lower their school attendance (and possibly also the effort they put into school more generally).

[Figure 1 about here.]

Almost two years after the intervention, we again surveyed the participants to study whether the edutainment show had had an impact on long-term occupational status, with a special focus on whether it had caused any of them to start their own business. We observe from panel A in Figure 2 that this is indeed the case among the female participants; the probability of having started up a business is 8.8 percentage points higher in the treatment group than in the control group (34.14% versus 25.33%, $p = 0.10$).[29] We do not find a similar treatment effect on startups for the males (26.8% versus and 28.1%). Interestingly, our long-term findings on business startups are very similar to our short-term findings on the demand for business training, as reported in Table 5. First, the size of the effect for females is almost the same for business startups as for the demand for business training (8.8 percentage points versus 5.8 percentage points), and second, for both measures there is no effect for the males.

[Figure 2 about here.]

Consistent with more females having failed the O-level exam and having started a business, we observe in panel B in Figure 2 that it is less likely that they self-report currently being a student (47.6% versus 60.0%, $p = 0.11$).[30] In this case, we also observe a strong negative effect for the males (30.4% versus 62.0%, $p = 0.01$).

In panels C and D in Figure 2 we report long-term effects on employment and whether the students have moved since secondary school.[31] In panel C, we observe that it is less likely that the treated students are employed, but these effects are not

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[29]The participants reported having started various types of kiosks and retail activities on the street, including selling snacks, water, chips, or other small products. Others had entered into repair work, computers, general welding, and low level financial intermediation (tigo pesa or m-pesa). The p-value is here from a one-sided test of equality, since the initial hypothesis clearly was that the edutainment show should increase the likelihood of starting a business. See also Table A17, which shows that the business startup effect for females is only borderline significant in the regression analysis.

[30]We do not have detailed data on what they are studying. They may have continued with A-level secondary schooling, vocational education or be repeating classes for a retake of the O-level exam.

[31]In the long-term survey, we also collected information on marriage and child-bearing; 9% of the participants were married and 8.2% had or expected a child. We do not find any difference between the treatment group and the control group on these two variables.

statistically significant (males: 9.0% versus 11.2%, $p = 0.70$, females: 10.0% versus 17.3%, $p = 0.25$). In panel D we observe that it is more likely that the treated participants have moved, which is consistent with the edutainment show making them more entrepreneurial in their thinking and therefore also more willing to move in order to seek out economic opportunities. The treatment effect on whether they have moved is statistically significant for females, but not for males (males: 25% versus 17.1%, $p = 0.26$; females: 36.6% versus 23.3%, $p = 0.05$).

Taken together, the long-term findings provide strong evidence for the edutainment show having shaped the long-term behavior of the viewers. In particular, we observe that the edutainment show caused poorer school performance and made it less likely that the students continued schooling, and, correspondingly, we find an increase in business startups for the female viewers.

7   Concluding remarks

We have shown that an edutainment show on entrepreneurship broadcasted on national television had both a short-term and a long-term impact on the youth in a developing country where there are few formal employment opportunities; in the short-term, it made the viewers more interested in entrepreneurship and business and shaped non-cognitive traits, and in the long-term it generated more business startups. Our study thus demonstrates that an edutainment show has the potential to both inspire and initiate behavioral change. At the same time, we find limited evidence of the show impacting the business knowledge of the viewers, which suggests that it is more challenging to use an edutainment as a vehicle for knowledge transmission. Finally, we find that encouragement of entrepreneurship caused the youth to invest less in schooling, which seems to reflect that they do not consider the present education to be particularly relevant for business. This spillover effect from entrepreneurship education to schooling serves as a reminder of the importance of taking a broad view when evaluating the impact of different field interventions.

Edutainment shows broadcasted on television and radio represent an intriguing approach to a host of development issues, since they are potentially low-cost interventions with large outreach. More research is therefore needed to understand how these shows impact viewers and initiate behavioral and social change. In particular, an open question remains whether there are ways of making edutainment shows a ve-

hicle for knowledge transmission, and as such a complement to the formal education, particularly in developing countries. Another interesting avenue for future research is to study whether edutainment shows may be used in different settings in addition to being broadcasted on television, for example at schools or in villages by the use of mobile cinema, and thereby serve as a point of departure for teaching and community discussions. Finally, the digital revolution opens up new approaches to edutainment education, where for example digital games allow individuals to explore and learn by role-taking (Singhal, 2013), and it will be interesting for future research to tap into these opportunities and study how they can support human capital formation in developing countries.

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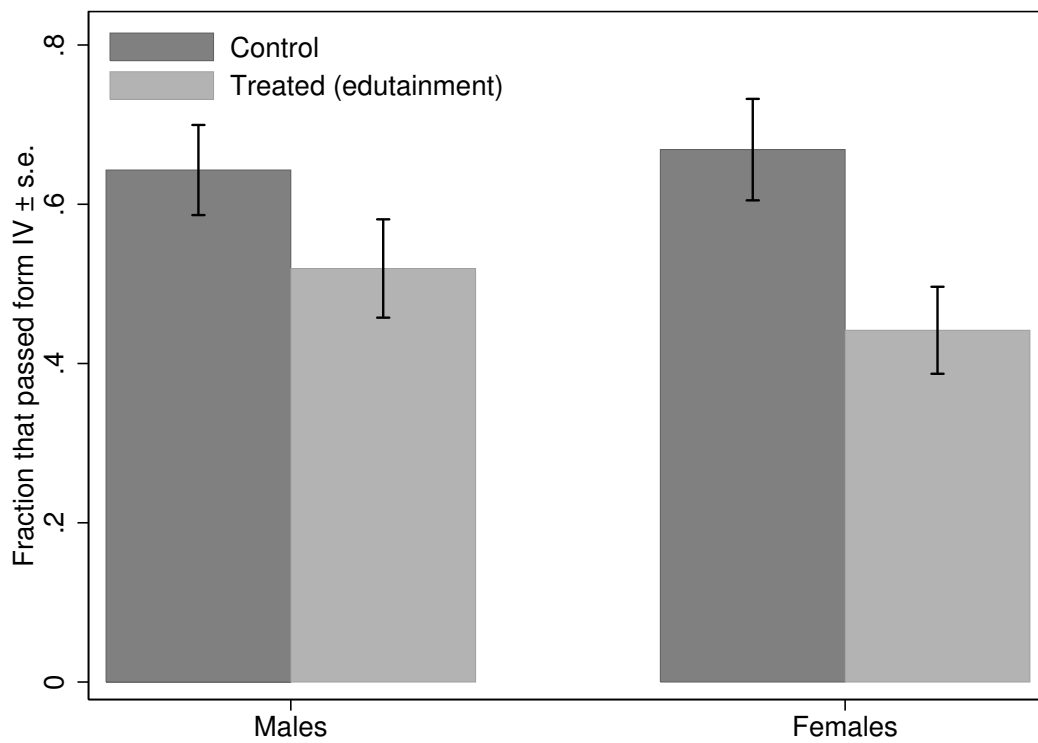
Figure 1: Share that passed final exam

Note: The figure reports the share of participants that passed the final O-level exam in 2011, by treatment and gender. Standard errors (clustered on school level) are indicated.
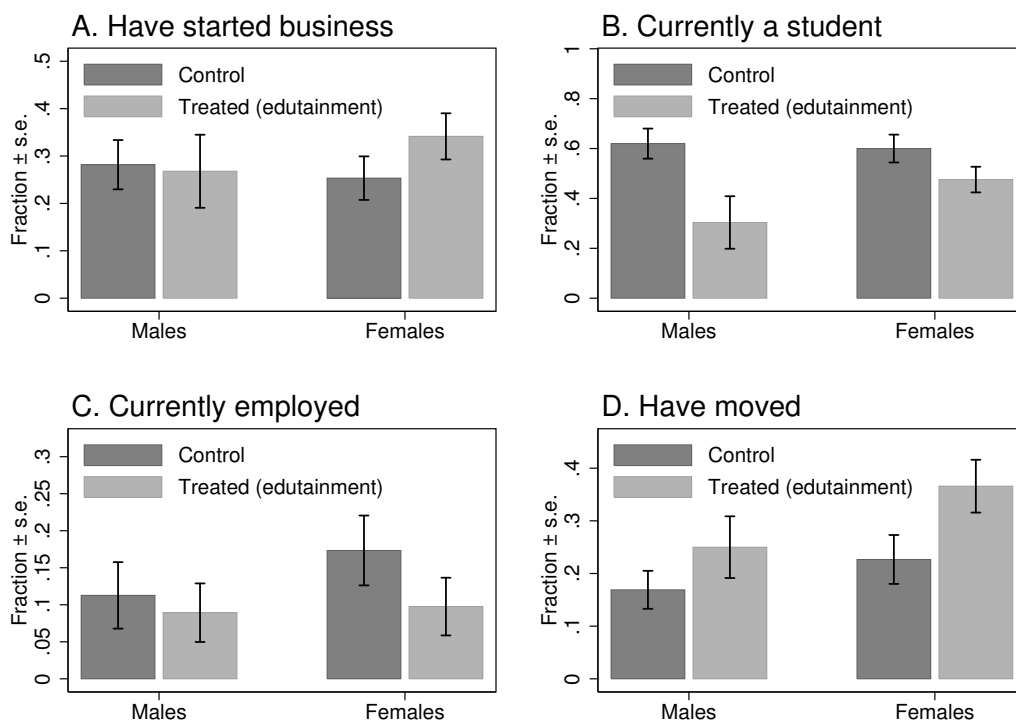
Figure 2: Long-term impact on behavior

Note: The figure reports from the long-term survey, by treatment and gender. Panel A: The share of participants who have started a business. Panel B: The share of participants who are currently a student. Panel C: The share of students who are currently employed. Panel D: The share of students who have moved since secondary school. Standard errors (clustered on school level) are indicated.

Table 1: Timeline of the research project

Period	Event
1. January 2011	Baseline study and focus group discussions
2. Spring 2011	11 episodes of Ruka Juu aired
3. March 2011	Mid-term quiz
4. June 2011	Lab experiment and focus group discussions
5. Spring 2012	Collection of administrative data from (Dec 2011) exams
6. Spring and summer 2013	Long-term follow-up

Table 2: Treatment-Control Balance

		Treatment status			
	All	Control	Treated	Difference	*p*-value
Male	0.445	0.516	0.369	-0.147	0.005
	(0.027)	(0.037)	(0.032)	(0.050)	
Age	17.91	17.94	17.89	-0.041	0.736
	(0.059)	(0.076)	(0.093)	(0.076)	
Household with no parents	0.257	0.231	0.286	0.056	0.005
	(0.010)	(0.012)	(0.014)	(0.019)	
Access to tv	3.404	3.350	3.463	0.113	0.270
	(0.052)	(0.085)	(0.054)	(0.102)	
Business stream	0.383	0.346	0.422	0.076	0.601
	(0.073)	(0.102)	(0.102)	(0.144)	
Business knowledge	0.258	0.289	0.224	-0.066	0.085
	(0.019)	(0.027)	(0.026)	(0.037)	
Business ambitions	0.116	0.107	0.125	0.018	0.409
	(0.011)	(0.011)	(0.018)	(0.021)	
O-level failure rate for school	0.563	0.574	0.551	-0.023	0.621
	(0.023)	(0.025)	(0.038)	(0.046)	

Note: The table reports means of baseline variables by treatment. Male: indicator variable taking the value one if the participant is a male; Age: the age of the participant in years; Household with no parents: indicator variable taking the value one if the participant does not live with any of the parents; Access to tv: response to "If you want to watch your favourite TV-program, how easy is it for you to find a place to watch it?", scale from 1 (very difficult) to 5 (very easy); Business stream: indicator variable taking the value one if the participant is in the business stream at school; Business knowledge: indicator variable taking the value one if the participant answered correctly three questions about insurance, interest rate, and profits. Business ambitions: response to "What would you do if you had 1 million Tsh?" (1=Use them to buy something nice for myself or my family; 2= Use them to start a business; 3=Use them to pay for my education; 4= Other); O-level failure rate for school: the failure rate of the O-level exam in 2010 for the school of the participant. For two schools, we have used the 2012 failure rate, since 2010 data were not available. The *p*-value is for a test of no difference in means. Standard errors (in parentheses) are clustered on the school level.

Table 3: Attrition

	The lab experiment				Administrative (exam 2011)				Long-term survey			
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)
Treated (edutainment)	0.054***	0.052***	0.055**	0.053**	-0.009	-0.014	-0.009	-0.011	-0.001	0.010	0.060	0.064
	(0.019)	(0.018)	(0.026)	(0.025)	(0.013)	(0.014)	(0.019)	(0.021)	(0.066)	(0.065)	(0.079)	(0.080)
Treated × male			0.003	-0.003			-0.004	-0.007			-0.132	-0.123
			(0.037)	(0.037)			(0.019)	(0.020)			(0.105)	(0.108)
Male		0.003	0.010	0.004		-0.015	-0.008	-0.011		0.056	0.081	0.113*
		(0.018)	(0.022)	(0.023)		(0.013)	(0.015)	(0.019)		(0.057)	(0.064)	(0.066)
Age		0.003		0.002		0.007		0.007		-0.046**		-0.043*
		(0.007)		(0.007)		(0.006)		(0.006)		(0.022)		(0.023)
Household with no parents		0.009		0.009		-0.005		-0.005		-0.005		-0.005
		(0.014)		(0.014)		(0.011)		(0.011)		(0.042)		(0.042)
Access to tv		-0.004		-0.004		-0.004		-0.004		-0.000		0.001
		(0.006)		(0.006)		(0.004)		(0.004)		(0.024)		(0.025)
Business stream		-0.011		-0.011		-0.003		-0.003		0.025		0.033
		(0.018)		(0.018)		(0.011)		(0.011)		(0.054)		(0.054)
Business knowledge		-0.026*		-0.026*		0.007		0.006		-0.003		-0.006
		(0.015)		(0.015)		(0.010)		(0.010)		(0.050)		(0.049)
Business ambitions		0.072***		0.072***		0.038**		0.038**		-0.006		-0.006
		(0.024)		(0.024)		(0.015)		(0.015)		(0.094)		(0.094)
O-level failure rate for school		-0.041		-0.041		-0.084		-0.084		0.256		0.234
		(0.070)		(0.070)		(0.055)		(0.055)		(0.162)		(0.156)
Constant	0.076***	0.068	0.071***	0.068	0.041***	-0.020	0.045**	-0.021	0.341***	0.982**	0.299***	0.924**
	(0.010)	(0.118)	(0.013)	(0.116)	(0.012)	(0.094)	(0.018)	(0.094)	(0.044)	(0.423)	(0.046)	(0.425)
Observations	2132	2113	2132	2113	2132	2113	2132	2113	429	426	429	426
R^2	0.008	0.017	0.008	0.017	0.001	0.012	0.001	0.012	0.000	0.015	0.005	0.019

Note: The table reports linear regressions in which the dependent variable is an indicator for attrition in the lab data (columns 1-4), administrative data (columns 5-8), and long-term data (9-12). Treated: indicator variable for the participant being in the treatment group. Treated × male: interaction variable between Treated and Male. Male: indicator variable taking the value one if the participant is a male; Age: the age of the participant in years; Household with no parents: indicator variable taking the value one if the participant does not live with any of the parents; Access to tv: response to "If you want to watch your favourite TV-program, how easy is it for you to find a place to watch it?", scale from 1 (very difficult) to 5 (very easy); Business stream: indicator variable taking the value one if the participant is in the business stream at school; Business knowledge: indicator variable taking the value one if the participant answered correctly three questions about insurance, interest rate, and profits. Business ambitions: response to "What would you do if you had 1 million Tsh?" (1=Use them to buy something nice for myself or my family; 2= Use them to start a business; 3=Use them to pay for my education; 4= Other); O-level failure rate for school: the failure rate of the O-level exam in 2010 for the school of the participant.Standard errors are clustered on schools ($*: p < 0.10, **: p < 0.05, ***: p < 0.01$).

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Table 4: Impact on exposure to the edutainment show

	Content question (Incentivized)		Episodes watched (Non-incentivized)	
	Edutainment	Weekend movie	Edutainment	Weekend movie
Treated (edutainment)	1.700***	-1.417***	3.326***	-1.575***
	(0.149)	(0.134)	(0.271)	(0.272)
Treated × male	0.113	-0.023	0.209	-0.143
	(0.202)	(0.180)	(0.318)	(0.292)
Male	-0.227*	-0.367***	-0.170	-0.069
	(0.122)	(0.134)	(0.181)	(0.253)
Treatment on males	1.813***	-1.440***	3.535***	-1.718***
	(0.169)	(0.200)	(0.290)	(0.233)
Observations	1898	1898	1850	1882
R^2	0.233	0.169	0.326	0.069
Statistics on dependent variable (in control group):				
Mean	3.710	6.159	2.184	3.762
Standard deviation	1.678	1.879	2.489	3.582

Note: The table reports linear regressions in which the dependent variable is: column 1, the participant's number of correct answers about program content of the edutainment show (incentivised, 0-10); column 2, the participant's number of correct answers about program content of the weekend movie (incentivized, 0-10); column 3, number of episodes the participant watched of the edutainment show (self-reported, 0-11); column 4, number of episodes the participant watched of the weekend movie (self-reported, 0-11). Treated: indicator variable for the participant being in the treatment group. Treated × male: interaction variable between Treated and Male. Male: indicator variable taking the value one if the participant is a male. Also included in the regressions but not reported are the other background variables reported in Table 2. See Table A6 in Appendix A for full regressions including all controls. Treatment on Males: the linear combination of Treated and Treated × male. Standard errors in parentheses are clustered on schools (* : $p < 0.10$,** : $p < 0.05$,*** : $p < 0.01$).

Table 5: Impact on ambitions

	Demand for business training		Rating of having	Ambition
	Incentivized	Self-report	own business	index
Treated (edutainment)	0.058*	0.112***	0.119	0.259**
	(0.032)	(0.039)	(0.084)	(0.108)
Treated × male	-0.045*	0.026	0.078	0.015
	(0.026)	(0.047)	(0.104)	(0.107)
Male	0.016	-0.054	-0.041	-0.066
	(0.018)	(0.040)	(0.071)	(0.091)
Treatment on males	0.012	0.138***	0.197***	0.274***
	(0.029)	(0.035)	(0.071)	(0.074)
Observations	1898	1893	1847	1843
R^2	0.008	0.043	0.014	0.038
Statistics on dependent variable (in control group):				
Mean	0.079	0.573	2.776	1.210
Standard deviation	0.270	0.495	0.948	1.000

Note: The table reports linear regressions in which the dependent variable is: column 1, an indicator variable taking the value one if the participant wants to spend 4000 Ths on two additional weekend courses in entrepreneurship; column 2, an indicator variable taking the value one if the participant chooses training in entrepreneurship as the preferred free week-long training course; column 3, a variable reflecting how the participant ranks (if income and work hours were kept constant) having an own business relative to being employed in public sector, being employed in private sector, and farming, (1-4, 4=own business is ranked as first choice), column 4, an index which is the sum of the indicator variables from columns 1 and 2 and an indicator variable taking the value one if the dependent variable in column 3 takes the value 4 (own business is ranked as first choice). Treated: indicator variable for the participant being in the treatment group. Treated: indicator variable for the participant being in the treatment group.Treated × male: interaction variable between Treated and Male. Male: indicator variable taking the value one if the participant is a male. Also included in the regressions but not reported are the other background variables reported in Table 2. See Table A8 in Appendix A for full regressions including all controls. Treatment on Males: the linear combination of Treated and Treated × male. Standard errors in parentheses are clustered on schools ($^*: p < 0.10, ^{**}: p < 0.05, ^{***}: p < 0.01$).

Table 6: Impact on knowledge

| | Macro | Business: | | | |
	Facts	Facts	Concepts	Practice	Knowledge index
Treated (edutainment)	0.038	0.049	-0.170*	-0.110	-0.192
	(0.094)	(0.054)	(0.097)	(0.139)	(0.243)
Treated × male	0.141	-0.003	0.051	0.098	0.287
	(0.113)	(0.066)	(0.107)	(0.159)	(0.284)
Male	0.289***	-0.053	0.145**	0.135	0.517***
	(0.076)	(0.053)	(0.069)	(0.110)	(0.188)
Treatment on males	0.179*	0.046	-0.119	-0.012	0.095
	(0.096)	(0.042)	(0.089)	(0.134)	(0.253)
Observations	1898	1898	1898	1898	1898
R^2	0.020	0.009	0.047	0.027	0.042
Statistics on dependent variable (in control group):					
Mean	2.204	0.855	1.509	1.509	8.617
Standard deviation	1.286	0.719	0.875	0.875	2.625

The second-level header spanning: Subindices (over Macro, Business). Business spans Facts, Concepts, Practice.

Note: The table reports linear regressions in which the dependent variable is the participant's number of correct answers on incentivized questions about different topics taught by the edutainment show: Macroeconomic facts (0-8); Business facts (0-3); Business concepts (0-3); Business practices (0-10); Knowledge index (0-24, sum of all answers). Treated: indicator variable for the participant being in the treatment group. Treated × male: interaction variable between Treated and Male. Male: indicator variable taking the value one if the participant is a male. Also included in the regressions but not reported are the other background variables reported in Table 2. See Table A10 in Appendix A for full regressions including all controls. Treatment on Males: the linear combination of Treated and Treated × male. Standard errors in parentheses are clustered on schools (* : $p < 0.10$,** : $p < 0.05$,*** : $p < 0.01$).

Table 7: Impact on mindset

	Risk	Patience	Compete	Mind-set index
Treated (edutainment)	0.145**	0.164	-0.056	0.114
	(0.069)	(0.189)	(0.107)	(0.133)
Treated × male	-0.148*	-0.210	0.083	-0.102
	(0.075)	(0.162)	(0.079)	(0.130)
Male	0.091*	-0.082	0.008	0.050
	(0.049)	(0.084)	(0.062)	(0.089)
Treatment on males	-0.003	-0.046	0.028	0.013
	(0.076)	(0.136)	(0.087)	(0.119)
Observations	1898	1898	1897	1897
R^2	0.015	0.015	0.040	0.012
Statistics on dependent variable (in control group):				
Mean	1.329	3.375	0.375	2.763
Standard deviation	0.718	1.497	0.484	1.000

Note: The table reports linear regressions in which the dependent variable is: column 1, the number of times the participant chooses the risky alternative (0-3); column 2, the number of times the participant chooses the later payment date (0-6); column 3, an indicator variable taking the value one if the participant chooses to compete (column 3); column 4, a mind-set index of the dependent variables in columns 1-3 in which each variable is weighted by the inverse standard deviation in the control group and then normalized to have unit variance in the control group. Treated: indicator variable for the participant being in the treatment group. Treated × male: interaction variable between Treated and Male. Male: indicator variable taking the value one if the participant is a male. Also included in the regressions but not reported are the other background variables reported in Table 2. See Table A12 in Appendix A for full regressions including all controls. Treatment on Males: the linear combination of Treated and Treated × male. Standard errors in parentheses are clustered on schools ($^*: p < 0.10, ^{**}: p < 0.05, ^{***}: p < 0.01$).

A Appendix: Additional analysis

We here provide complementary analysis, as referred to in the main text.

A.1 Additional figures
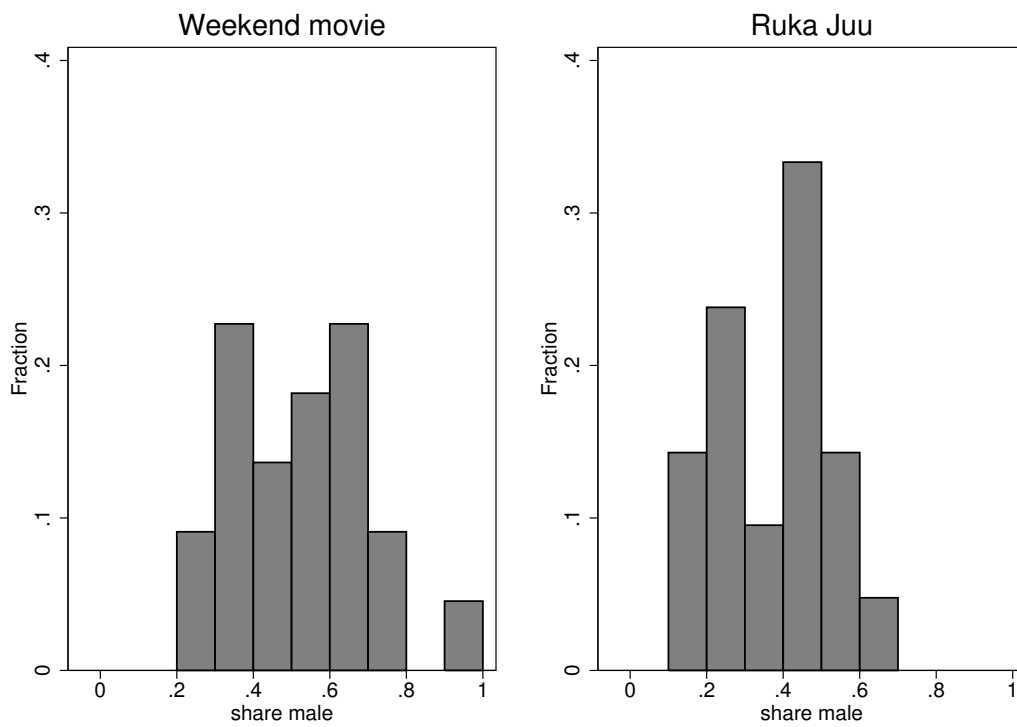
Figure A1: Distributions of gender composition by treatment
Note: Histograms of share of females at each school by treatment.
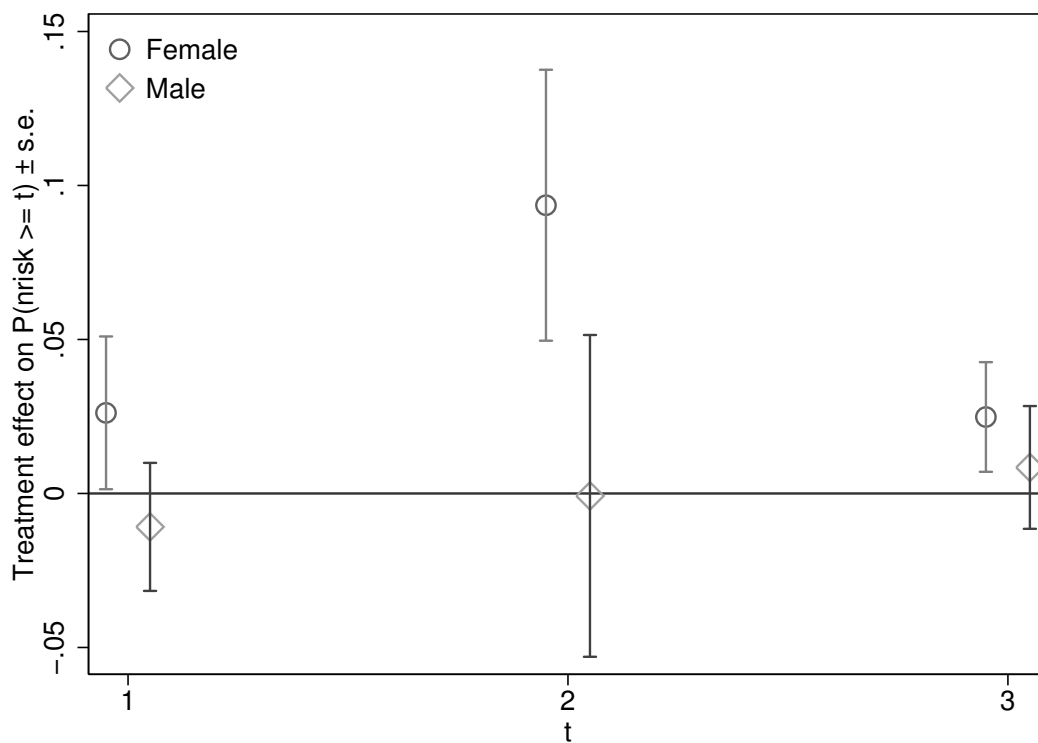
Figure A2: Treatments effect on willingness to take risk (alternative definitions)
Note:The figure reports the treatment effects for males and females on risk for alternative definitions of the willingness to take risk. The willingness to take risk is here defined by an indicator variable that takes the value one if the participant chooses the risky alternative at least 1/2/3 times.
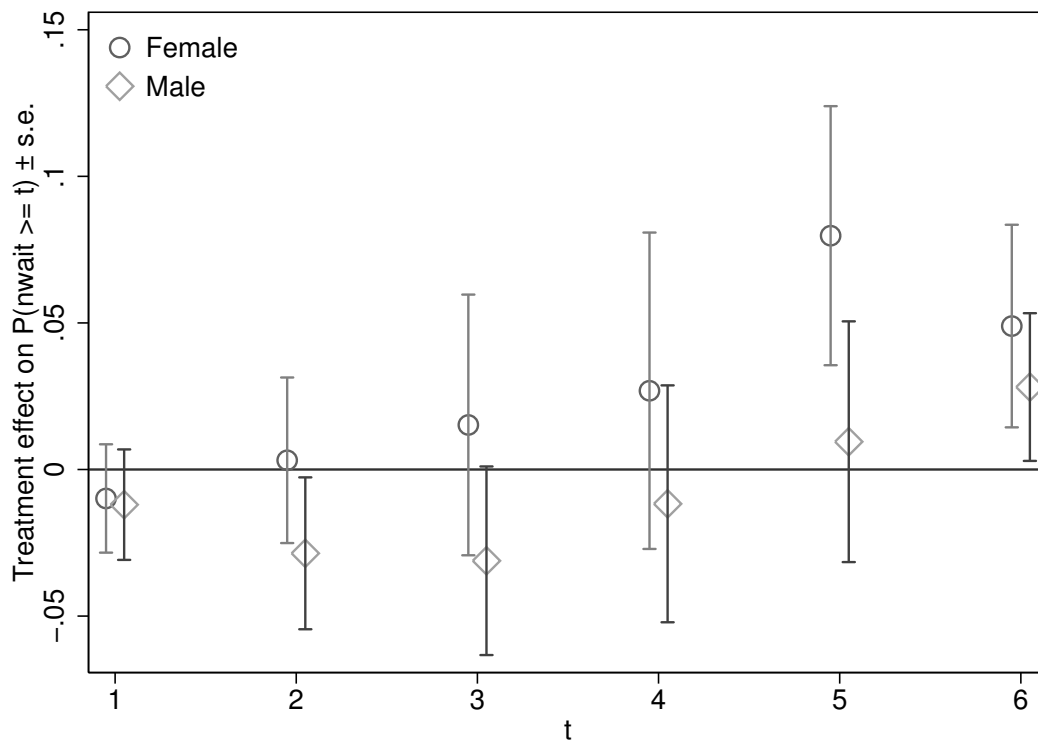
Figure A3: Treatment effects on patience (alternative definitions)

Note:The figure reports the treatment effects for males and females on patience for alternative definitions. Patience is here defined by an indicator variable that takes the value one if the participant chooses the later payment date at least 1/2/3/4/5/6 times.

A.2 Additional tables

Table A1: Treatment-Control Balance (males)

| | | Treatment status | | | |
	All	Control	Treated	Difference	*p*-value
Age	18.28	18.29	18.27	-0.019	0.913
	(0.079)	(0.090)	(0.146)	(0.172)	
Household with no parents	0.258	0.236	0.292	0.056	0.053
	(0.014)	(0.018)	(0.022)	(0.028)	
Access to tv	3.415	3.338	3.468	0.087	0.452
	(0.062)	(0.093)	(0.068)	(0.115)	
Business stream	0.296	0.238	0.385	0.147	0.289
	(0.067)	(0.080)	(0.111)	(0.137)	
Business knowledge	0.235	0.272	0.179	-0.093	0.011
	(0.020)	(0.027)	(0.023)	(0.035)	
Business ambitions	0.143	0.126	0.170	0.044	0.147
	(0.014)	(0.016)	(0.025)	(0.029)	
O-level failure rate for school	0.573	0.582	0.558	-0.024	0.670
	(0.025)	(0.026)	(0.049)	(0.056)	

Note: For details, see Table 2.

Table A2: Treatment-Control Balance (females)

	All	Treatment status		Difference	*p*-value
		Control	Treated		
Age	17.62	17.56	17.67	0.116	0.260
	(0.052)	(0.067)	(0.076)	(0.101)	
Household with no parents	0.257	0.225	0.283	0.058	0.007
	(0.011)	(0.015)	(0.014)	(0.021)	
Access to tv	3.396	3.318	3.460	0.143	0.262
	(0.062)	(0.106)	(0.067)	(0.125)	
Business stream	0.452	0.462	0.444	-0.018	0.912
	(0.078)	(0.118)	(0.103)	(0.157)	
Business knowledge	0.276	0.308	0.250	-0.058	0.240
	(0.024)	(0.038)	(0.031)	(0.049)	
Business ambitions	0.094	0.088	0.099	0.012	0.622
	(0.012)	(0.013)	(0.019)	(0.023)	
O-level failure rate for school	0.555	0.565	0.547	-0.018	0.673
	(0.022)	(0.026)	(0.034)	(0.043)	

Note: For details, see Table 2.

Table A3: Treatment-Control Balance (lab sample)

		Treatment status			
	All	Control	Treated	Difference	p-value
Male	0.444	0.513	0.365	-0.148	0.005
	(0.028)	(0.037)	(0.034)	(0.050)	
Age	17.91	17.94	17.89	-0.064	0.609
	(0.061)	(0.077)	(0.098)	(0.125)	
Household with no parents	0.254	0.229	0.283	0.054	0.009
	(0.011)	(0.013)	(0.015)	(0.020)	
Access to tv	3.408	3.348	3.477	0.129	0.228
	(0.055)	(0.090)	(0.055)	(0.106)	
Business stream	0.385	0.346	0.429	0.083	0.572
	(0.073)	(0.103)	(0.103)	(0.145)	
Business knowledge	0.264	0.290	0.235	-0.054	0.182
	(0.021)	(0.030)	(0.027)	(0.040)	
Business ambitions	0.108	0.101	0.116	0.015	0.496
	(0.011)	(0.012)	(0.019)	(0.022)	
O-level failure rate for school	0.564	0.572	0.554	-0.019	0.697
	(0.023)	(0.025)	(0.040)	(0.047)	

Note: For details, see Table 2.

Table A4: Treatment-Control Balance (admin sample)

		Treatment status			
	All	Control	Treated	Difference	*p*-value
Male	0.447	0.518	0.371	-0.148	0.006
	(0.027)	(0.038)	(0.033)	(0.050)	
Age	17.91	17.93	17.89	-0.043	0.727
	(0.061)	(0.079)	(0.096)	(0.124)	
Household with no parents	0.258	0.229	0.289	0.059	0.006
	(0.011)	(0.013)	(0.016)	(0.020)	
Access to tv	3.410	3.360	3.464	0.104	0.327
	(0.054)	(0.090)	(0.055)	(0.105)	
Business stream	0.383	0.345	0.424	0.079	0.587
	(0.072)	(0.102)	(0.101)	(0.144)	
Business knowledge	0.256	0.288	0.221	-0.067	0.080
	(0.019)	(0.027)	(0.026)	(0.037)	
Business ambitions	0.113	0.103	0.122	0.019	0.403
	(0.011)	(0.011)	(0.019)	(0.022)	
O-level failure rate for school	0.564	0.576	0.552	-0.025	0.592
	(0.023)	(0.025)	(0.038)	(0.046)	

Note: For details, see Table 2.

Table A5: Treatment-Control Balance (long term sample)

		Treatment status			
	All	Control	Treated	Difference	*p*-value
Male	0.447	0.486	0.406	-0.081	0.406
	(0.048)	(0.062)	(0.073)	(0.096)	
Age	18.06	17.99	18.14	0.159	0.497
	(0.116)	(0.127)	(0.193)	(0.231)	
Household with no parents	0.271	0.219	0.326	0.107	0.023
	(0.024)	(0.031)	(0.033)	(0.045)	
Access to tv	3.459	3.361	3.562	0.201	0.236
	(0.086)	(0.146)	(0.080)	(0.167)	
Business stream	0.363	0.342	0.384	0.042	0.785
	(0.076)	(0.103)	(0.111)	(0.152)	
Business knowledge	0.253	0.247	0.261	0.014	0.779
	(0.025)	(0.031)	(0.040)	(0.051)	
Business ambitions	0.106	0.123	0.087	-0.036	0.347
	(0.019)	(0.027)	(0.027)	(0.038)	
O-level failure rate for school	0.557	0.565	0.549	-0.016	0.756
	(0.026)	(0.025)	(0.046)	(0.052)	

Note: For details, see Table 2

Table A6: Impact on exposure to the edutainment show, full model

	Content question (Incentivized)		Episodes watched (Non-incentivized)	
	Edutainment	Weekend movie	Edutainment	Weekend movie
Treated (edutainment)	1.700***	-1.417***	3.326***	-1.575***
	(0.149)	(0.134)	(0.271)	(0.272)
Treated × male	0.113	-0.023	0.209	-0.143
	(0.202)	(0.180)	(0.318)	(0.292)
Male	-0.227*	-0.367***	-0.170	-0.069
	(0.122)	(0.134)	(0.181)	(0.253)
Age	-0.123***	-0.170***	-0.155**	-0.098
	(0.032)	(0.036)	(0.068)	(0.066)
Household with no parents	0.055	-0.095	-0.012	-0.006
	(0.087)	(0.101)	(0.131)	(0.129)
Access to tv	0.117***	0.133***	0.142**	0.134**
	(0.036)	(0.040)	(0.066)	(0.065)
Business stream	0.121	0.032	0.442*	0.012
	(0.119)	(0.135)	(0.219)	(0.191)
Business knowledge	0.032	0.244**	-0.198	-0.161
	(0.077)	(0.105)	(0.175)	(0.137)
Business ambitions	-0.015	-0.253*	-0.145	0.136
	(0.132)	(0.140)	(0.203)	(0.244)
O-level failure rate for school	-1.479***	-1.111**	-2.571***	-0.929
	(0.388)	(0.518)	(0.910)	(0.691)
Constant	6.424***	9.561***	5.974***	5.690***
	(0.641)	(0.693)	(1.299)	(1.357)
Observations	1898	1898	1850	1882
R^2	0.233	0.169	0.326	0.069

Note: Full version of Table 4. Standard errors in parentheses are clustered on schools (* : $p < 0.10$,** : $p < 0.05$,*** : $p < 0.01$)

Table A7: Impact on exposure to edutainment show – without control variables/upper and lower bounds on treatment effect

	Content question (Incentivized)		Episodes watched (Non-incentivized)	
	Edutainment	Weekend movie	Edutainment	Weekend movie
Regressions:				
Treated (edutainment)	1.713***	-1.410***	3.360***	-1.575***
	(0.182)	(0.147)	(0.311)	(0.272)
Treated $\times$ male	0.165	-0.021	0.331	-0.143
	(0.203)	(0.195)	(0.314)	(0.292)
Male	-0.362***	-0.514***	-0.416**	-0.069
	(0.133)	(0.156)	(0.201)	(0.253)
Observations	1915	1915	1867	1882
R^2	0.206	0.134	0.298	0.069
Upper and lower bounds on treatment effects:				
Male upper bound	2.089	-1.211	4.064	-0.962
	(0.193)	(0.255)	(0.322)	(0.215)
Male lower bound	1.695	-1.705	3.577	-1.914
	(0.205)	(0.250)	(0.357)	(0.281)
Female upper bound	1.950	-1.239	3.749	-0.914
	(0.216)	(0.172)	(0.347)	(0.198)
Female lower bound	1.524	-1.648	3.235	-1.761
	(0.186)	(0.177)	(0.318)	(0.292)

Note: Version of Table 4 without control variables and with non-parametric bounds. Standard errors in parentheses are clustered on schools (* : $p < 0.10$,** : $p < 0.05$,*** : $p < 0.01$). Upper and lower bounds calculated using the method of Lee (2009). Standard errors for the bounds are bootstrapped with 1000 replications, resampling at the school level.

Table A8: Impact on ambitions, full model

	Demand for business training		Rating of having	Summary
	Incentivized	Self-report	own business	index
Treated (edutainment)	0.058*	0.112***	0.119	0.259**
	(0.032)	(0.039)	(0.084)	(0.108)
Treated × male	-0.045*	0.026	0.078	0.015
	(0.026)	(0.047)	(0.104)	(0.107)
Male	0.016	-0.054	-0.041	-0.066
	(0.018)	(0.040)	(0.071)	(0.091)
Age	0.007	-0.009	-0.004	-0.003
	(0.006)	(0.011)	(0.019)	(0.020)
Household with no parents	-0.008	0.065**	0.011	0.075*
	(0.014)	(0.026)	(0.043)	(0.040)
Access to tv	0.001	0.007	0.027	0.028
	(0.005)	(0.011)	(0.023)	(0.027)
Business stream	-0.017	0.056*	0.031	0.068
	(0.026)	(0.028)	(0.062)	(0.074)
Business knowledge	0.004	0.028	0.105*	0.142**
	(0.019)	(0.025)	(0.057)	(0.061)
Business ambitions	0.028	0.070**	0.139*	0.198**
	(0.027)	(0.034)	(0.078)	(0.077)
O-level failure rate for school	0.006	-0.255**	-0.101	-0.484**
	(0.079)	(0.100)	(0.156)	(0.238)
Constant	-0.052	0.832***	2.784***	1.387***
	(0.115)	(0.195)	(0.336)	(0.344)
Observations	1898	1893	1847	1843
R^2	0.008	0.043	0.014	0.038

Note: Full version of Table 5. Standard errors in parentheses are clustered on schools (* : $p < 0.10,^{**}$: $p < 0.05,^{***}$: $p < 0.01$)

Table A9: Impact on ambitions – without control variables/upper and lower bounds on treatment effect

	Demand for business training		Rating of having	Ambition
	Incentivized	Self-report	own business	index
Treated (edutainment)	0.060*	0.117***	0.125	0.268**
	(0.033)	(0.040)	(0.085)	(0.105)
Treated × male	-0.049*	0.039	0.070	0.025
	(0.027)	(0.046)	(0.104)	(0.114)
Male	0.025	-0.075*	-0.050	-0.089
	(0.016)	(0.039)	(0.071)	(0.091)
Observations	1915	1910	1863	1859
R^2	0.006	0.026	0.007	0.022
Upper and lower bounds on treatment effects:				
Male upper bound	·	0.185	0.266	0.356
		(0.046)	(0.090)	(0.096)
Male lower bound	·	0.122	0.094	0.231
		(0.042)	(0.086)	(0.102)
Female upper bound	·	0.140	0.181	0.310
		(0.048)	(0.101)	(0.105)
Female lower bound	·	0.080	0.040	0.209
		(0.040)	(0.093)	(0.109)

Note: Version of Table 5 without control variables and with non-parametric bounds. Standard errors in parentheses are clustered on schools (* : $p < 0.10$,** : $p < 0.05$,*** : $p < 0.01$). Upper and lower bounds calculated using the method of Lee (2009). Standard errors for the bounds are bootstrapped with 1000 replications, resampling at the school level. Incentivized business training is chosen by too few participants for it to be possible to calculate the Lee (2009) bounds for Demand for business training (incentivized).

Table A10: Impact on knowledge, full model

	Subindices				
	Macro	Business related:			
	Facts	Facts	Concepts	Practice	Knowledge index
Treated (edutainment)	0.038	0.049	-0.170*	-0.110	-0.192
	(0.094)	(0.054)	(0.097)	(0.139)	(0.243)
Treated × male	0.141	-0.003	0.051	0.098	0.287
	(0.113)	(0.066)	(0.107)	(0.159)	(0.284)
Male	0.289***	-0.053	0.145**	0.135	0.517***
	(0.076)	(0.053)	(0.069)	(0.110)	(0.188)
Age	-0.051*	-0.019	0.006	-0.098**	-0.162***
	(0.029)	(0.018)	(0.016)	(0.038)	(0.059)
Household with no parents	0.124*	0.034	-0.008	0.040	0.190
	(0.073)	(0.037)	(0.049)	(0.091)	(0.144)
Access to tv	-0.042	0.004	0.022	0.041	0.025
	(0.026)	(0.016)	(0.018)	(0.036)	(0.059)
Business stream	0.066	0.040	0.260***	0.233**	0.599***
	(0.072)	(0.039)	(0.086)	(0.108)	(0.205)
Business knowledge	0.084	-0.032	0.026	-0.002	0.076
	(0.074)	(0.031)	(0.047)	(0.091)	(0.129)
Business ambitions	0.005	0.056	-0.151**	-0.076	-0.166
	(0.097)	(0.058)	(0.064)	(0.123)	(0.205)
O-level failure rate for school	-0.187	-0.187*	-0.623**	-1.155***	-2.152***
	(0.290)	(0.099)	(0.246)	(0.277)	(0.736)
Constant	3.148***	1.300***	1.525***	6.182***	12.155***
	(0.462)	(0.323)	(0.284)	(0.657)	(1.022)
Constant	3.148***	1.300***	1.525***	6.182***	12.155***
	(0.462)	(0.323)	(0.284)	(0.657)	(1.022)
Observations	1898	1898	1898	1898	1898
R^2	0.020	0.009	0.047	0.027	0.042

Note: Full version of Table 6. Standard errors in parentheses are clustered on schools (* : $p < 0.10,$** : $p < 0.05,$*** : $p < 0.01$)

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Table A11: Impact on knowledge – without control variables/upper and lower bounds on treatment effect

| | Subindices | | | | |
| | Macro | Business related: | | | |
	Facts	Facts	Concepts	Practice	Knowledge index
Treated (edutainment)	0.029	0.048	-0.163	-0.105	-0.192
	(0.096)	(0.055)	(0.111)	(0.160)	(0.292)
Treated × male	0.176	0.018	0.086	0.166	0.446
	(0.111)	(0.069)	(0.108)	(0.171)	(0.296)
Male	0.229***	-0.076	0.079	-0.010	0.221
	(0.075)	(0.050)	(0.075)	(0.114)	(0.194)
Observations	1915	1915	1915	1915	1915
R^2	0.015	0.004	0.012	0.001	0.007
Upper and lower bounds on treatment effects:					
Male upper bound	0.390	0.144	0.020	0.284	0.629
	(0.112)	(0.068)	(0.093)	(0.170)	(0.298)
Male lower bound	0.050	0.011	-0.180	-0.112	-0.051
	(0.109)	(0.052)	(0.117)	(0.167)	(0.322)
Female upper bound	0.202	0.125	-0.067	0.095	0.168
	(0.120)	(0.074)	(0.131)	(0.186)	(0.333)
Female lower bound	-0.101	-0.008	-0.254	-0.274	-0.498
	(0.116)	(0.059)	(0.118)	(0.159)	(0.290)

Note: Version of Table 6 without control variables and with non-parametric bounds. Standard errors in parentheses are clustered on schools (* : $p < 0.10$,** : $p < 0.05$,*** : $p < 0.01$). Upper and lower bounds calculated using the method of Lee (2009). Standard errors for the bounds are bootstrapped with 1000 replications, resampling at the school level.

Table A12: Impact on mindset, full model

	Risk	Patience	Compete	Mind-set index
Treated (edutainment)	0.145**	0.164	-0.056	0.114
	(0.069)	(0.189)	(0.107)	(0.133)
Treated $\times$ male	-0.148*	-0.210	0.083	-0.102
	(0.075)	(0.162)	(0.079)	(0.130)
Male	0.091*	-0.082	0.008	0.050
	(0.049)	(0.084)	(0.062)	(0.089)
Age	-0.006	-0.022	0.023	0.013
	(0.014)	(0.029)	(0.016)	(0.024)
Household with no parents	0.026	-0.053	-0.032	-0.038
	(0.047)	(0.083)	(0.022)	(0.054)
Access to tv	0.009	-0.038	-0.010	-0.018
	(0.018)	(0.040)	(0.016)	(0.030)
Business stream	-0.084	0.211	0.107	0.141
	(0.063)	(0.160)	(0.087)	(0.099)
Business knowledge	0.116***	-0.043	-0.061*	0.002
	(0.034)	(0.078)	(0.035)	(0.062)
Business ambitions	0.073	-0.209**	-0.062	-0.095
	(0.056)	(0.099)	(0.037)	(0.069)
O-level failure rate for school	0.117	0.014	-0.453	-0.435
	(0.174)	(0.422)	(0.294)	(0.335)
Constant	1.279***	3.901***	0.245	2.772***
	(0.279)	(0.589)	(0.359)	(0.458)
Observations	1898	1898	1897	1897
R^2	0.015	0.015	0.040	0.012

Note: Full version of Table 7. Standard errors in parentheses are clustered on schools ($^*: p < 0.10,^{**}: p < 0.05,^{***}: p < 0.01$)

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Table A13: Impact on mindset – without control variables/upper and lower bounds on treatment effect

	Risk	Patience	Compete	Mind-set index
Treated (edutainment)	0.146*	0.144	-0.045	0.120
	(0.073)	(0.193)	(0.111)	(0.132)
Treated $\times$ male	-0.165**	-0.167	0.092	-0.089
	(0.074)	(0.175)	(0.084)	(0.133)
Male	0.102**	-0.153	-0.000	0.022
	(0.049)	(0.104)	(0.070)	(0.096)
Observations	1915	1915	1914	1914
R^2	0.006	0.007	0.004	0.002
Upper and lower bounds on treatment effects:				
Male upper bound	0.088	0.157	0.089	0.208
	(0.080)	(0.150)	(0.099)	(0.131)
Male lower bound	-0.110	-0.230	0.022	-0.062
	(0.076)	(0.185)	(0.100)	(0.136)
Female upper bound	0.238	0.303	-0.005	0.274
	(0.067)	(0.229)	(0.114)	(0.147)
Female lower bound	0.067	-0.039	-0.069	0.011
	(0.083)	(0.182)	(0.113)	(0.123)

Note: Version of Table 7 without control variables and with non-parametric bounds. Standard errors in parentheses are clustered on schools (* : $p < 0.10$,** : $p < 0.05$,*** : $p < 0.01$). Upper and lower bounds calculated using the method of Lee (2009). Standard errors for the bounds are bootstrapped with 1000 replications, resampling at the school level.

Table A14: Impact on social preferences

	Incentivized		
	Money for self	Proportional bonus	Unfairness of salary inequality
Treated (edutainment)	0.021	0.034	0.024
	(0.022)	(0.038)	(0.093)
Treated $\times$ male	-0.036	-0.051	0.053
	(0.021)	(0.045)	(0.117)
Male	0.028	0.076**	-0.117
	(0.017)	(0.030)	(0.080)
Treatment on males	-0.015	-0.017	0.077
	(0.019)	(0.044)	(0.099)
Observations	1898	1898	1893
R^2	0.015	0.019	0.005
Statistics on dependent variable (in control group):			
Mean	0.619	0.728	3.966
Standard deviation	0.212	0.445	1.550

Note: The table reports linear regressions in which the dependent variable is: column 1, the share of money the participant allocated to him- or herself out of 2000 TSh in a real-effort dictator game; column 2, an indicator variable taking the value one if the participant in a spectator choice decided to divide proportionality (and not equally) in a spectator choice involving two other participants; column 3, the participant's response to an hypothetical question about whether an income difference between a teacher and a doctor is fair (1-5, 1-the income difference is completely fair, 5-the income difference is completely unfair). Treated: indicator variable for the participant being in the treatment group. Treated $\times$ male: interaction variable between Treated and Male. Male: indicator variable taking the value one if the participant is a male. Also included in the regressions but not reported are the other background variables reported in Table 2. See Table A15 for full regressions including all controls. Treatment on Males: the linear combination of Treated and Treated $\times$ male. Standard errors in parentheses are clustered on schools ($^{*}: p < 0.10,^{**}: p < 0.05,^{***}: p < 0.01$).

Table A15: Impact on social preferences, full model

	Incentivized		Unfairness of salary inequality
	Money for self	Proportional bonus	
Treated × male	-0.036	-0.051	0.053
	(0.021)	(0.045)	(0.117)
Male	0.028	0.076**	-0.117
	(0.017)	(0.030)	(0.080)
Age	0.003	-0.027***	-0.014
	(0.005)	(0.009)	(0.031)
Household with no parents	-0.028***	0.019	0.066
	(0.009)	(0.024)	(0.076)
Access to tv	-0.002	-0.004	-0.027
	(0.005)	(0.011)	(0.029)
Business stream	-0.017	0.041	0.039
	(0.017)	(0.029)	(0.079)
Business knowledge	0.029**	-0.002	-0.039
	(0.014)	(0.024)	(0.083)
Business ambitions	-0.035**	-0.007	-0.047
	(0.015)	(0.028)	(0.121)
O-level failure rate for school	-0.056	-0.268**	-0.437*
	(0.039)	(0.120)	(0.227)
Constant	0.593***	1.319***	4.617***
	(0.103)	(0.179)	(0.596)
Observations	1898	1898	1893
R^2	0.015	0.019	0.005

Note: Full version of Table A14. Standard errors in parentheses are clustered on schools (* : $p < 0.10$,** : $p < 0.05$,*** : $p < 0.01$)

Table A16: Impact on social preferences – without control variables/upper and lower bounds on treatment effect

	Incentivized		Unfairness of salary inequality
	Money for self	Proportional bonus	
Treated (edutainment)	0.019	0.034	0.036
	(0.021)	(0.040)	(0.095)
Treated × male	-0.041*	-0.036	0.071
	(0.022)	(0.043)	(0.117)
Male	0.031*	0.044	-0.149**
	(0.016)	(0.028)	(0.072)
Observations	1915	1915	1910
R^2	0.003	0.002	0.002
Upper and lower bounds on treatment effects:			
Male upper bound	0.002	0.015	0.182
	(0.023)	(0.047)	(0.103)
Male lower bound	-0.043	-0.051	-0.090
	(0.017)	(0.054)	(0.159)
Female upper bound	0.044	0.053	0.093
	(0.025)	(0.044)	(0.102)
Female lower bound	0.002	-0.010	-0.147
	(0.021)	(0.045)	(0.143)

Note: Version of Table A14 without control variables and with non-parametric bounds. Standard errors in parentheses are clustered on schools (* : $p < 0.10$,** : $p < 0.05$,*** : $p < 0.01$). Upper and lower bounds calculated using the method of Lee (2009). Standard errors for the bounds are bootstrapped with 1000 replications, resampling at the school level.

Table A17: Long-term behavior – with and without control variables

A. With control variables

	Administrative	Long-term survey			
	Passed final exam	Have started business	Is currently a student	Is currently employed	Have moved
Treated (Edutainment)	-0.233***	0.081	-0.099	-0.073	0.106
	(0.067)	(0.069)	(0.077)	(0.064)	(0.077)
Treated × male	0.077	-0.059	-0.200*	0.067	-0.087
	(0.058)	(0.109)	(0.115)	(0.075)	(0.094)
Male	0.065*	0.001	0.127	-0.084	-0.067
	(0.037)	(0.062)	(0.082)	(0.054)	(0.076)
Treatment on males	-0.156**	0.022	-0.299***	-0.007	0.020
	(0.064)	(0.086)	(0.094)	(0.056)	(0.068)
Observations	2024	281	281	279	281
R^2	0.164	0.022	0.141	0.025	0.095

B. Without control variables

	Administrative	Long-term survey			
	Passed final exam form	Have started business	Is currently a student	Is currently employed	Have moved
Treated (Edutainment)	-0.227***	0.088	-0.124	-0.073	0.139**
	(0.084)	(0.067)	(0.076)	(0.063)	(0.069)
Treated × male	0.103	-0.102	-0.192	0.050	-0.058
	(0.064)	(0.121)	(0.139)	(0.077)	(0.082)
Male	-0.026	0.028	0.020	-0.061	-0.058
	(0.047)	(0.068)	(0.078)	(0.060)	(0.059)
Treatment on males	-0.124	-0.014	-0.316**	-0.023	0.081
	(0.084)	(0.093)	(0.122)	(0.060)	(0.069)
Observations	2039	281	284	282	284
R^2	0.038	0.022	0.056	0.010	0.029

Statistics on dependent variable (in control group):

Mean	0.655	0.267	0.610	0.144	0.199
Standard deviation	0.475	0.444	0.490	0.352	0.400

Note: The upper panel in the table reports linear regressions in which the dependent variable is: column 1, an indicator variable taking the value one if the participant passed the final O-level exam; column 2, an indicator variable taking the value one if the participant has started a business; column 3, an indicator variable taking the value one if the participant is currently a student, column 4, an indicator variable taking the value one if the participant is currently employed; column 5, an indicator variable taking the value one if the participant has moved since the short-term survey. Treated: indicator variable for the participant being in the treatment group. Treated × male: interaction variable between Treated and Male. Male: indicator variable taking the value one if the participant is a male. Also included in the regressions but not reported are the other background variables reported in Table 2. Treatment on Males: the linear combination of Treated and Treated × male. The lower panel in the table shows the corresponding regressions without control variables. Standard errors in parentheses are clustered on schools ($^*: p < 0.10, ^{**}: p < 0.05, ^{***}: p < 0.01$). 53

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