

Project: Growth Mindset at Scale – Increasing school attainment by affecting the mindset of pupils and teachers.

Ingo Outes (Blavatnik School of Government, UK) Alan Sanchez (GRADE, Peru) and Renos Vakis (World Bank) (2017) ‘Growth Mindset at Scale: Impact of a psychosocial intervention on secondary school attainment in Peru’ (Work in Progress)

Our project seeks to harness the power of ‘growth mindsets’ to improve educational attainment among vulnerable groups. Promoting skill development for disadvantaged groups is a mechanism to help eradicate poverty and unlock prosperity in a developing country context. Recent experimental psychology studies from the US, have shown that small, context-sensitive psychosocial stimulations aimed at influencing students’ mindset can have large effects on educational outcomes, among vulnerable groups in particular. Our research agenda seeks to develop cost-effective, scalable and replicable ‘growth mindset’ interventions that work in a developing country contexts. In the first phase of our project, we introduced growth-mindset sessions in 400 secondary schools in Peru and find increased Mathematics test-scores (by 11-24% s.d.), higher pupil aspirations and increased teacher effort. Moreover, grade improvements appear to benefit low ability students the most. At a cost of just 0.2\$ per pupil, the growth-mindset sessions hold the promise of a highly cost-effective and scalable educational remediation tool.

Introduction

Implicit-theories of intelligence from psychology classify individuals according to the individual’s beliefs over their abilities. “Growth mindset” individuals - as opposed to “fixed mindset” - believe that their abilities are malleable, and can be changed with effort (Dweck and Leggett, 1988). Student’s mindsets are strongly linked to both academic and non-academic attitudes. Indeed, growth-mindset pupils present higher levels of motivation, persistence and resilience, and go on to achieve greater academic success (Dweck et al, 1995; Dweck, 2006).

Recent studies show that small and context-sensitive interventions can be effective in changing student mindsets (see Yeager and Walton, 2011, for a review). These interventions introduce student to the science of the brain: students are taught that the brain works like a muscle; the more it is exercised the stronger, more efficient and able it becomes. Growth mindset interventions in the US, have been found to be effective in increasing motivation and school attainment (Blackwell et al, 2007; Yeager et al, 2014; Paunescu et al, 2015). Moreover, the benefits seem to accrue over-proportionally to vulnerable groups, such as women, ethnic minorities or low socio-economic strata (Aronson et al, 2002; Good et al, 2003).

In policy circles, the importance of growth mindset on educational outcomes is increasingly being recognized; most recently in the World Development Report 2015, or the 2013 White House gathering on ‘Excellence in Education’.¹ Yet very little evidence exists for outside the US.² Our research seeks to address this knowledge gap by developing cost-effective, scalable and replicable ‘growth mindset’ interventions for a developing country contexts.

First Phase: 2015 Peru study

The first phase of the project was implemented in collaboration with the Ministry of Education of Peru in 2015. 799 schools were randomly assigned to implement a single 1.5-hour ‘Grow Your Mind’ (GYM) session that introduced students to new developments in neuroplasticity.

¹ See World Development Report 2015: Mind, Society, and Behavior, and see the White Paper by Yeager et al (2013) prepared for the White House gathering on ‘Excellence in Education: The Importance of Academic Mindsets’.

² A single evaluation study exists for the UK (EEF 2015), but so far no impacts were found on Year 5 students. A notable exception is a recent study from Turkey (Alan et al, 2016) that found school benefits from encouraging students to be more ‘gritty’.

Students were taught that abilities are not fixed and that the brain works much like a muscle: ‘with practice it will grow stronger’. We use the annual National Education Census (ECE) to assess GYM impact. The census administers standardised tests in Spanish and Mathematics to Year-8 pupils. GYM sessions were implemented two months before the ECE, in 400 treatment schools across the regions of Ancash and Junin (204 schools) and Lima (196 schools), and reached over 25,000 Year-8 students.

Table 1: GYM Impact, ITT and ATT/LATE, Impacts measured in % of a standard deviation, by Regions

		School-Average Score			
		Maths	Spanish	Index	Nr Schools
ITT - Standardised Scores	All Regions	0.107* [0.086]	0.076 [0.154]	0.092* [0.095]	799
	Non-Lima	0.204** [0.045]	0.115 [0.170]	0.159* [0.072]	408
ATT / LATE - Standardised Scores	All Regions	0.247* [0.086]	0.176 [0.154]	0.212* [0.095]	799
	Non-Lima	0.423** [0.044]	0.239 [0.170]	0.331* [0.071]	408

Two months after the sessions, school average Mathematics scores were significantly higher, but no effect was found in Spanish scores. Compared to controls, GYM schools scored higher in Mathematics by 11% of a standard deviation (see ITT estimates in Table 1). Logistical problem prevented some schools from implementing the sessions before the ECE tests. When this non-compliance is corrected for, we find that the ‘average treatment on the treated’ (see ATT / LATE estimates) was as high as 0.25 of standard deviation. For a single 1.5 hour session implemented by untrained local teachers, the magnitude of the benefits is remarkable.

Average impacts mask significant geographic variation. Lima schools display no GYM benefits – perhaps their more urban and chaotic nature being a factor. However, outside Lima where student achievement is lower, Maths scores were improved by 0.20-0.42 of a standard deviation (Table 1). The intervention was so successful that outside Lima a higher proportion of GYM schools gained school performance-rewards offered only to the top-20% in each local authority. While 21% of GYM schools were rewarded, only 14% of controls achieved the same distinction; a significant 50% increase on reward likelihood (results not shown).

The large impact of GYM can also be observed in score and grade distributions. In non-Lima regions, the Mathematics test-score distribution is shifted towards the upper tail (see Figure 1). Moreover, this led to particularly large Grade gains among poor ability students. Figure 2 shows the grade distribution among control schools versus the change observed in GYM schools. E.g. while 41.5% of control schools pupils score the lowest grade, ‘Beginning’, this likelihood is reduced by 5.16 percentage points in GYM schools. Similarly, likelihoods of scoring in the 3rd and 4th grade are increased by 2.16 and 2.30 percentage points. While GYM increases the prevalence of top grades, the largest grade benefits are accrued by lower ability students. The intervention prevented 5.16% of GYM students, or 550 pupils, in Ancash and Junin from scoring in the bottom grade of Mathematics.

The National Education Census also collects information on student beliefs, as well as teacher effort and attitudes – as reported by students. This allows us to explore some of the potential mechanisms of GYM impact. In non-Lima regions, we find evidence that GYM sessions might have changed the behaviour of *both* teachers and pupils alike (results not shown). Students that received the GYM sessions, report higher expectations of future academic achievement: 18% fewer students expect only to ‘complete secondary education’, while 8% more students expect to ‘complete a post-graduate degree’. On the other hand, teachers in GYM schools believe more in their student’s abilities: teachers are more likely to be ‘*always* encouraging of pupil’s study and learning’, and ‘*always* willing to offer additional help when needed’.

Figure 1: Mathematics Score Distributions, GYM vs Control, by Non-Lima and Lima regions

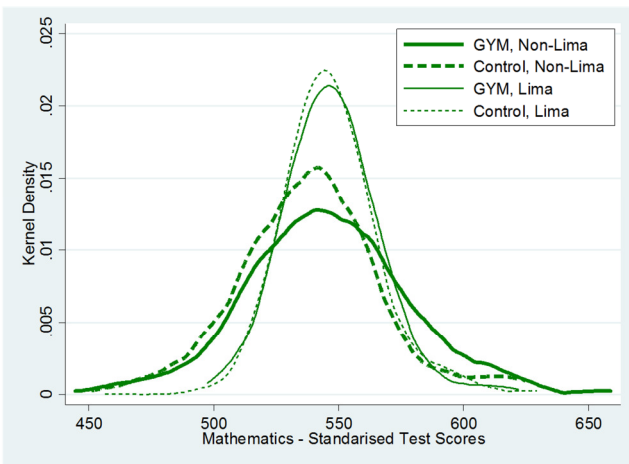
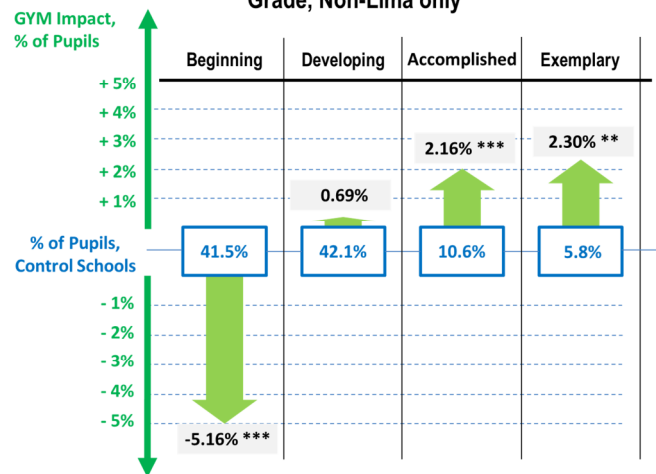


Figure 2: GYM Impact on Grade Distribution, % of Pupils by Grade, Non-Lima only



Cost-Effectiveness, Second-Phase and Future Research

The ‘Grow Your Mind’ sessions not only seem to achieve important improvements in student performance, but are also highly cost-effective and replicable. In 2015, GYM had a unit-cost of just \$0.2 per pupil. Implemented by public-school teachers during regular school hours, GYM requires no ad-hoc school-visit or teacher-training. In 2016, GYM in Peru was scaled-up to 1,356 schools across the Peruvian geography, reaching over 180,000 Year 7 and 8 students, at a similarly low unit-cost.

The project’s second phase (2016-2017) is focused on replication and refining the intervention tools. Beyond scaling-up in Peru, in Spring 2017 GYM was also introduced in 500 schools in Java, Indonesia, in collaboration with the local Ministry of Education. In the 2016/17 phase we complement the text-based delivery tools used in 2015, with video and comic-book delivery. We also developed a second GYM session focused on helping students to process failure and mistakes as part of a growth-mindset learning process. Such innovations are aimed at developing an intervention package that maximises GYM impact and reaches students across all abilities – including pupils with poor literacy and low levels of school engagement.

Our preliminary results present encouraging evidence, but before effective public policy can be developed based on growth-mindset tools, much remains to be understood. Can gains from a 1.5-hour session be sustained over time, and what is the optimal level of intervention intensity? Are pupils and their intrinsic mindsets the right context to target, or should teachers’ and parental mindsets also be the focus of policy interventions? Could an alignment of teacher incentives and mindsets yield even larger benefits? And more broadly, at what developmental stage (e.g. primary vs. secondary education) are psychosocial interventions most effective in increasing educational attainment and adult life economic opportunities? Our wider research programme seeks to address these critical policy questions.

Conclusions

The ‘Grow Your Mind’ intervention holds the promise of a highly cost-effective, scalable and replicable educational tool, designed to benefit pupils in a wide range of contexts, and in particular, improve attainment among pupils from vulnerable groups and low academic ability.

Our project is the first evaluation of a growth-mindset intervention in a developing country context, and the first globally at such a scale. With beneficiaries exceeding the hundreds of thousands of pupils across different geographic and cultural contexts, our project will provide robust evidence of the role that mindset interventions can play in education public policy.

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