



Conditional Cash Transfers and
Cognitive, Non-Cognitive outcomes:
The case of the *Bono de Desarrollo Humano* in Ecuador

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Máster en Economía del Desarrollo

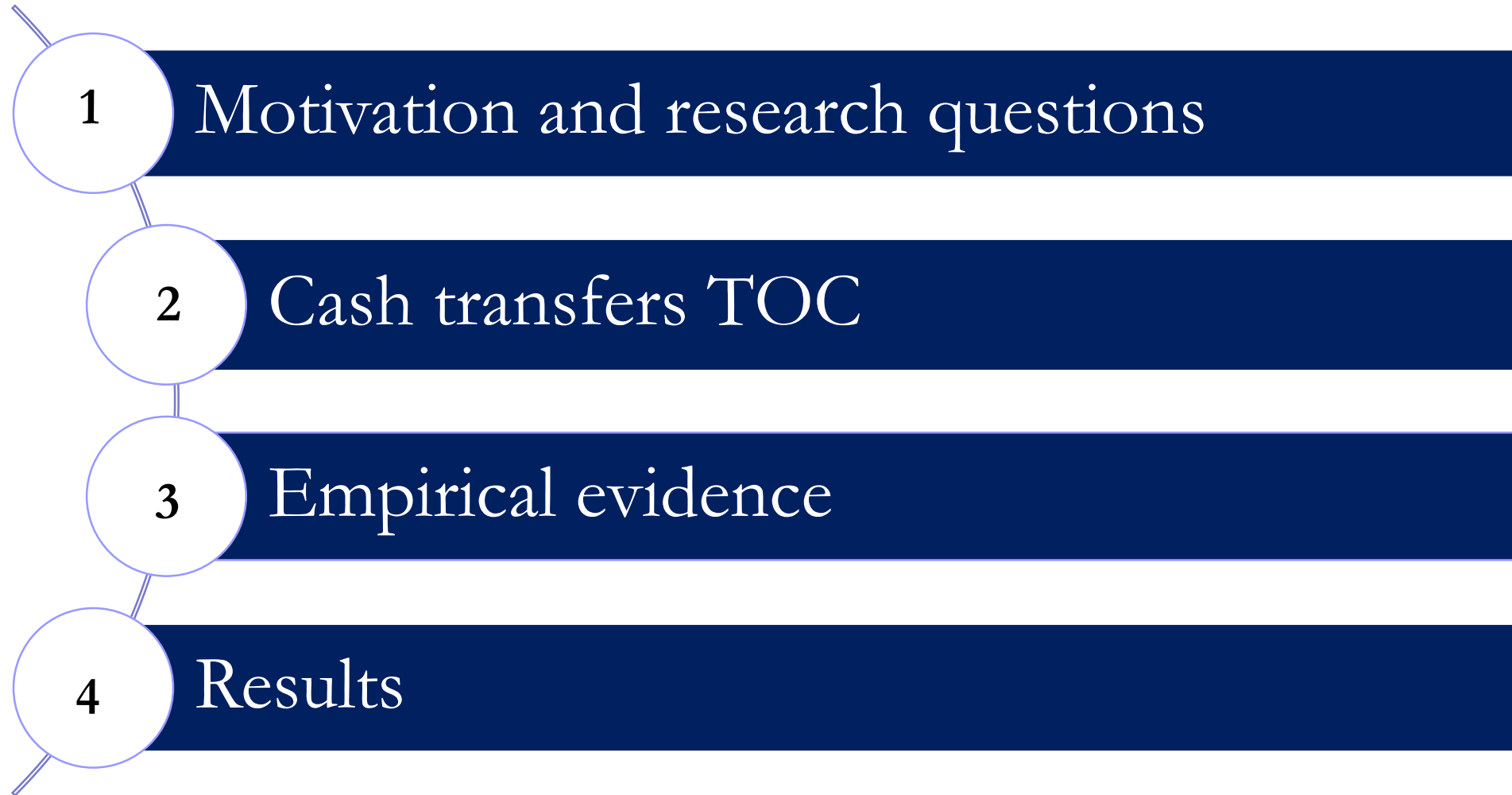
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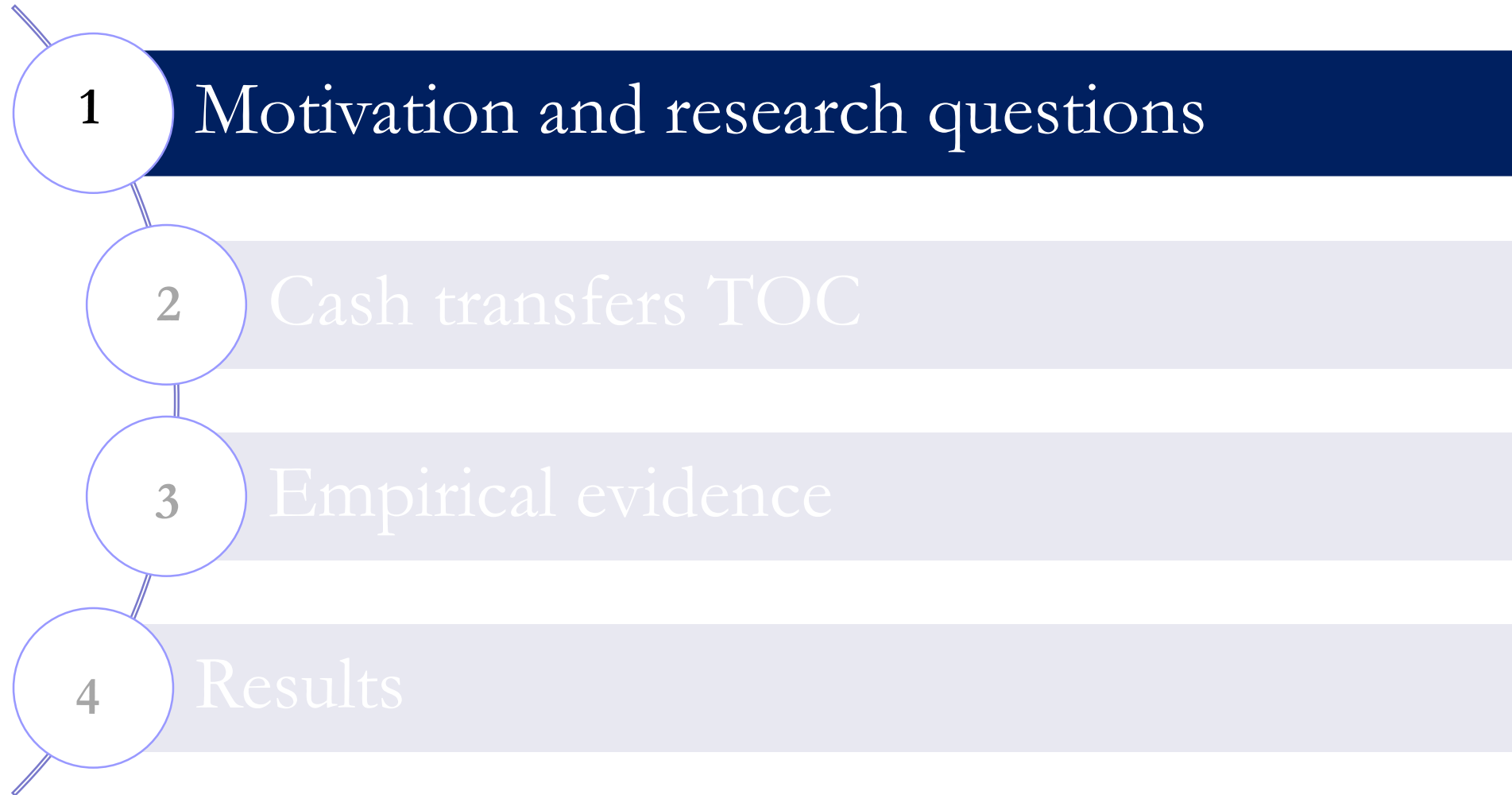
Abstract

- Objective: estimate the impacts of the BDH on high school students' attendance, cognitive, and non-cognitive outcomes for the academic period 2016-2017.
- Motivation:
 - Not only school attendance matters.
 - Students should learn and feel motivated to continue developing their capabilities.
 - Cash transfers should not only be money “handouts” but they should improve beneficiaries' well-being.
- Use data from Ser Bachiller exam and Associated Factor survey.
- Significant effects on school attendance, but negative impact on cognitive and non-cognitive outcomes.
- Not included: complete IV estimates tables, RS replication.

Presentation order



Presentation order



Concepts

Human capital accumulation



Improvement people's skills and capabilities

Access to development opportunities

Education

Health

(Becker 1993)



Cognitive skills



Abilities: **understanding complex ideas**, adaptation to the environment, learning from experience. (Neisser et al 1996)

more relevant in early life



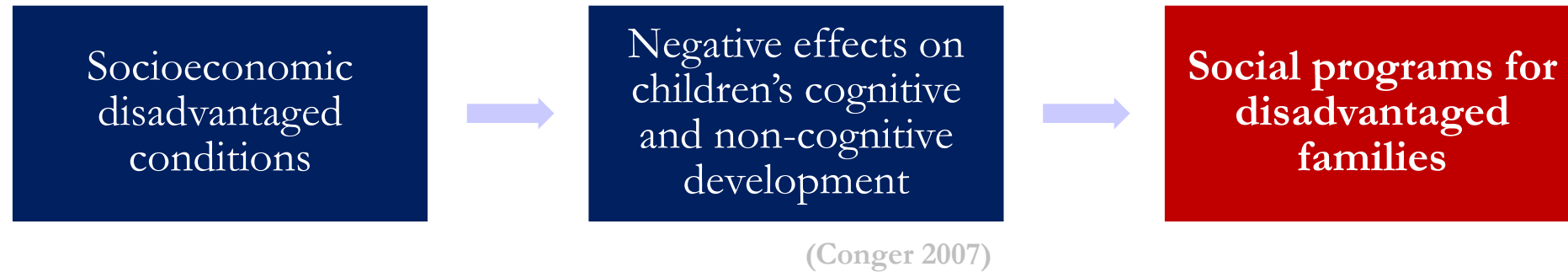
Non-cognitive skills



Patterns of thought, feelings and behavior (Borghans et al, 2008)
Covers social, emotional and personality domains: preferences, motivation, emotional stability, persistence and decision making among others

built in a higher degree during adolescence

Motivation



CASH TRANSFERS

Cash transfers: reducing poverty and inequality

- ✓ *Short term effects:* guarantee a minimum consumption level
- ✓ *Long term effects:* human capital accumulation

Ecuador: Bono de Desarrollo Humano-BDH- cash transfer (2003)

- ✓ Poorest households (wellbeing conditions)
- ✓ Soft conditionalities on school attendance and health controls

Potential BDH effects

BDH:

- Increased **school attendance**.
- +Attendance: children go more often to school and learn.
- Development of abilities: increased **cognitive skills**.
- Family economic stress relief: parents value children's education.
- Children's self-efficacy, self-esteem and expectations are better: **non-cognitive skills**.

Research Question

What are the impacts of the BDH on high school students' attendance, cognitive, and non-cognitive outcomes in the academic period 2016-2017?

Hypothesis 1

- BDH has a positive effect on school attendance
- The transfer has a co-responsibility with parents sending children to school.

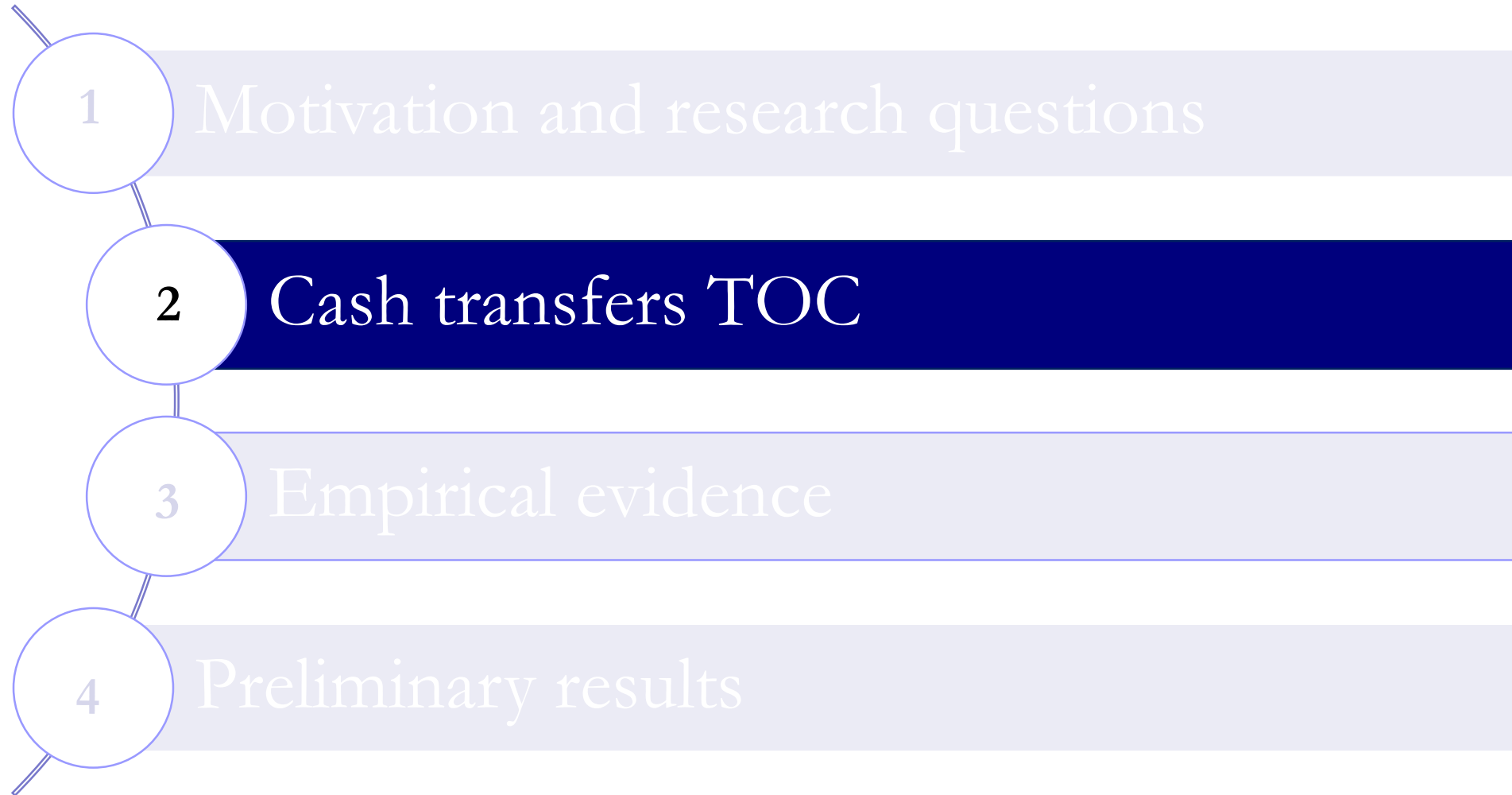
Hypothesis 2

- Positive relationship between the cash transfer and cognitive outcomes
- The cash transfer becomes an incentive for beneficiaries to develop their own human capital, therefore, they might effort more in school.

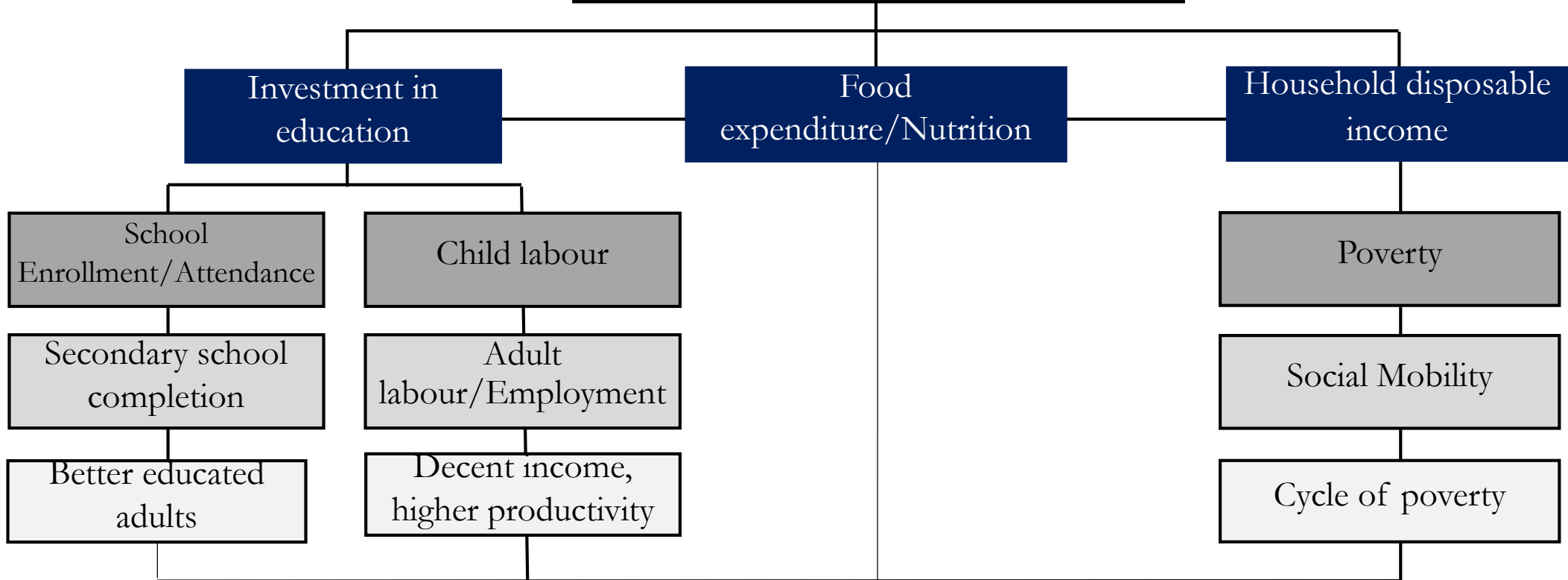
Hypothesis 3

- BDH has positive impacts on students' non-cognitive outcomes
- Is related with an improvement in family's emotional wellbeing by mitigating severe economic stress

Presentation order

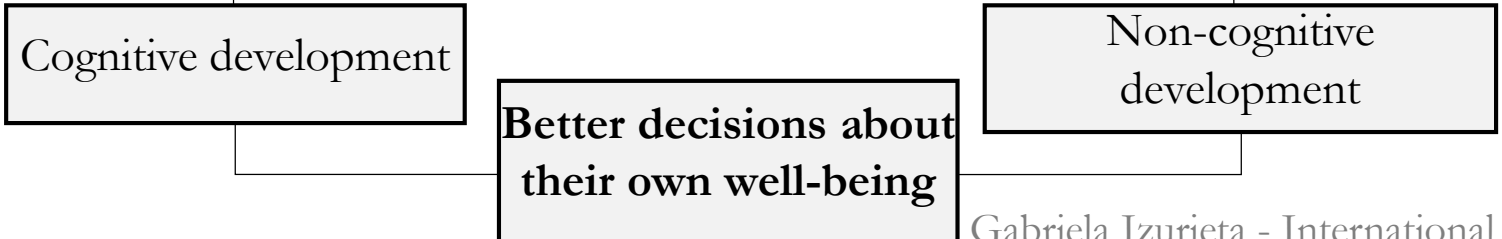


CASH TRANSFERS THEORY OF CHANGE

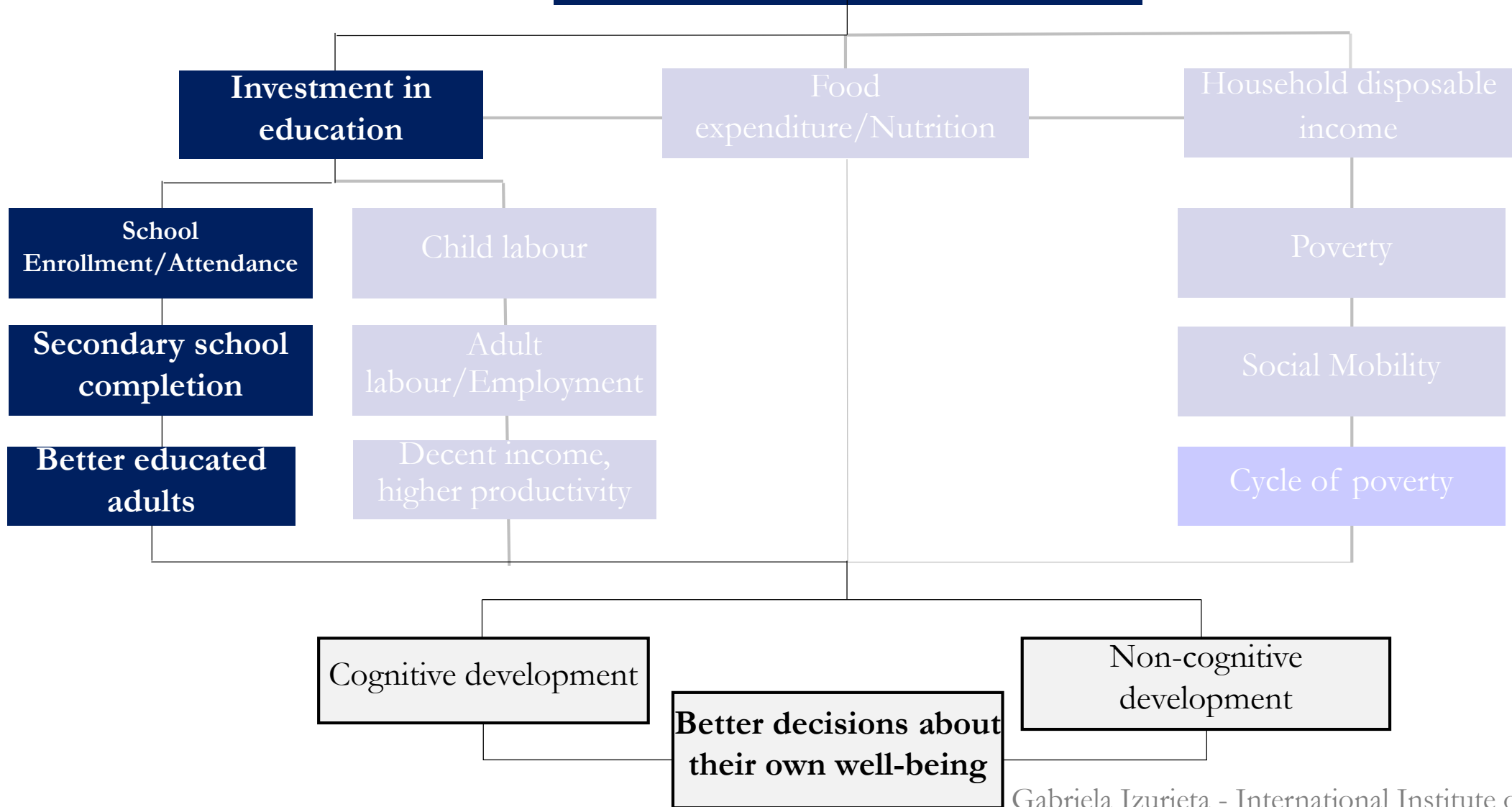


Sphere of influence Inputs (on the program's control)

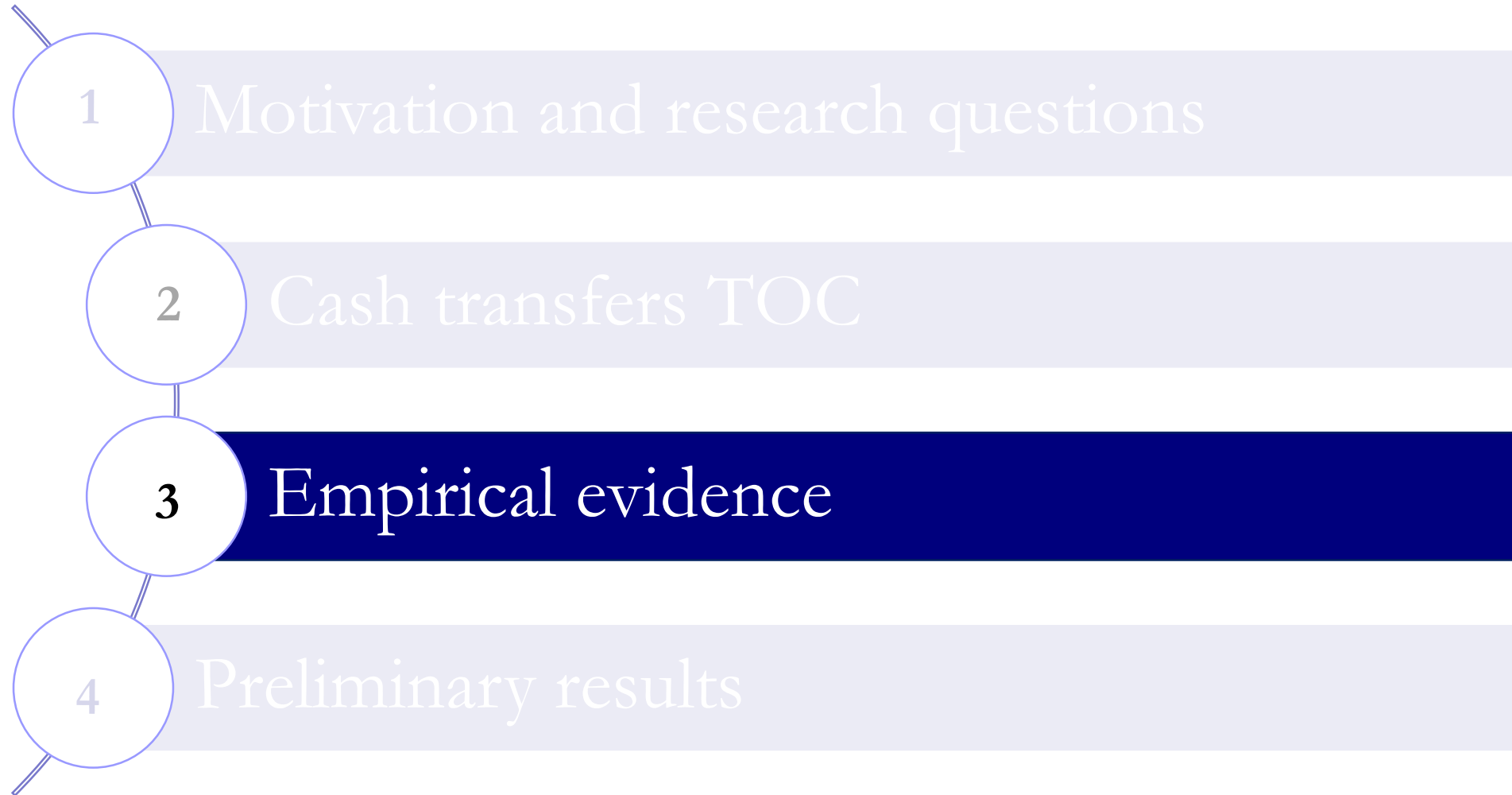
Sphere of Interest Outcomes/ impacts



CASH TRANSFERS THEORY OF CHANGE



Presentation order



Previous Evidence

Fernald et al. 2010:

- CTs: no influences on the cognitive measures.
- Decrease on behavior problems: emotional, conduct and hyperactivity disorders.
- Perceived economic stress reduction, improvement in psychological wellbeing: better family relationships.

Baez & Camacho 2011:

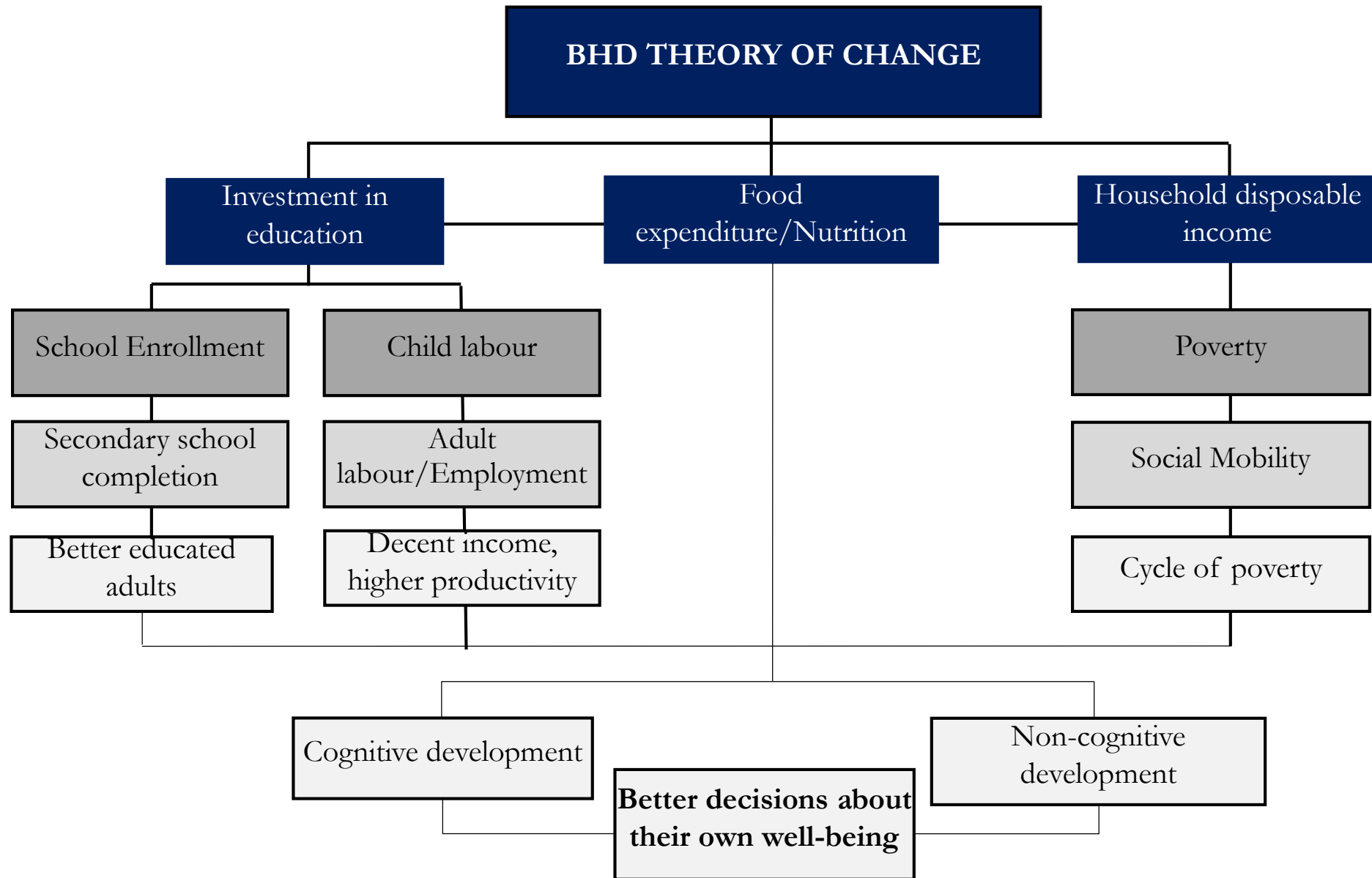
- School attendance is highly improved but not the case with scores.
- Non-correlation between attendance and better school performance.

Handa et al. 2014:

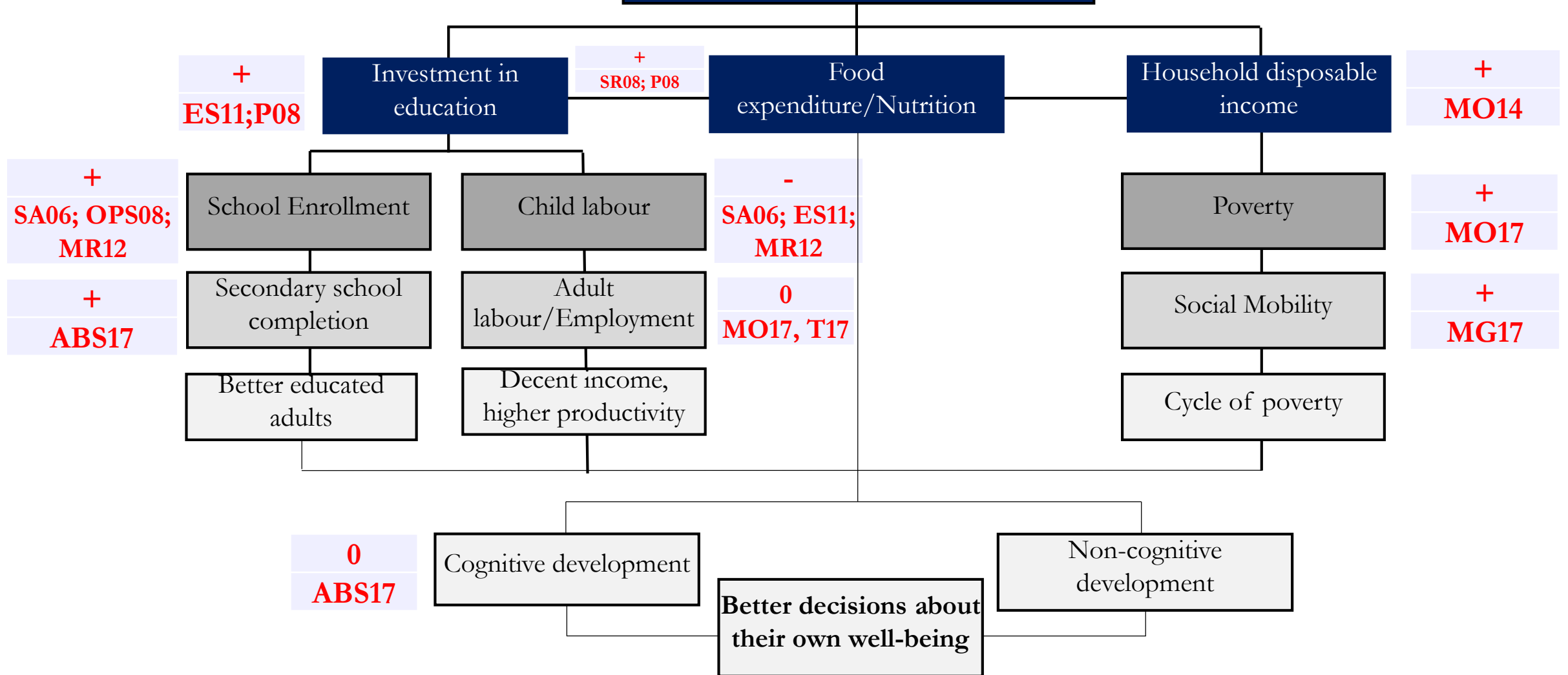
- Impact on well-being measures: non-cognitive outcomes
- Positive effects on beneficiaries' expectations about their life's improvement in the future.
- Beneficiaries feel happier and more positive about their future and their quality of life.

Attah et al. 2016:

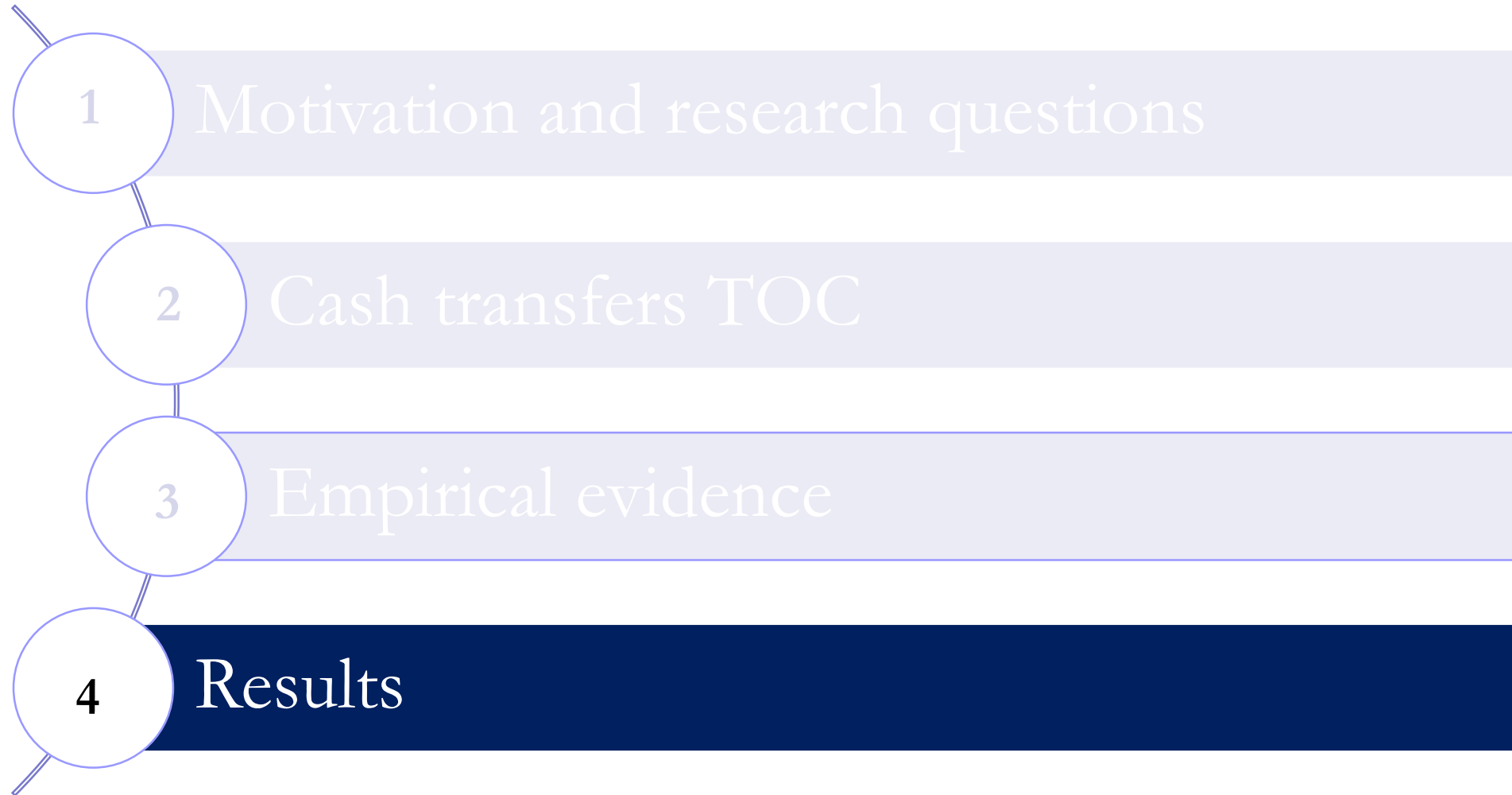
- Children value the fact that they are able to use clean clothing, to pay school fees and study material.
- Children's autonomy increases because their school performance only depends on their hard work and no other economic concerns.



BHD THEORY OF CHANGE



Presentation order



Data characteristics

National Higher Education Exam “Ser Bachiller”

- 2016-2017: **183.117 students** (BDH students: children of parents that are BDH beneficiaries)
- Exam Score
- General Characteristics (living conditions, BDH)
- Associated Factors Survey*

SER BACHILLER exam						
RS						
2012	2013	2014	2015	2016	2017	2018

BDH

Outcome measures

- School attendance.
- Cognitive outcomes:
 - Test score
 - Test score by domains: mathematics, literature, natural sciences and social sciences.
- Non-cognitive outcomes:
 - Self-efficacy, academic self-esteem and expectations.

Attendance

- Q: frequency with which they miss classes for a complete day during the last month of classes.
- The response options are: 5 or more times, 3 to 4 times, 2 to 3 times 1 to 2 times and never.
- Only the last option was considered to build a binary variable where 1: never absent and 0 otherwise.

Cognitive skills

Exam score: total score (over 10)

Four domains:

- Mathematical domain.
- Linguistic domain.
- Scientific domain.
- Social domain.

Non-cognitive skills

- AFS: 321 questions
- Self-efficacy, academic self-esteem and expectations
 - Consistency with the theory analysis
 - The quality of information that they present

Dimension	Survey statement	Type
Self-efficacy	I feel that the acquired knowledge motivates me to investigate more, develop new ideas and put them into practice	Yes/No
Academic self-esteem	I consider I am an excellent student in mathematics class	Yes/No
	I consider I am an excellent student in language class	Yes/No
	I consider I am an excellent student in sciences class	Yes/No
	I consider I am an excellent student in social studies class	Yes/No
Students' expectations	What is the maximum level of studies you would like to achieve? Master's degree	Yes/No

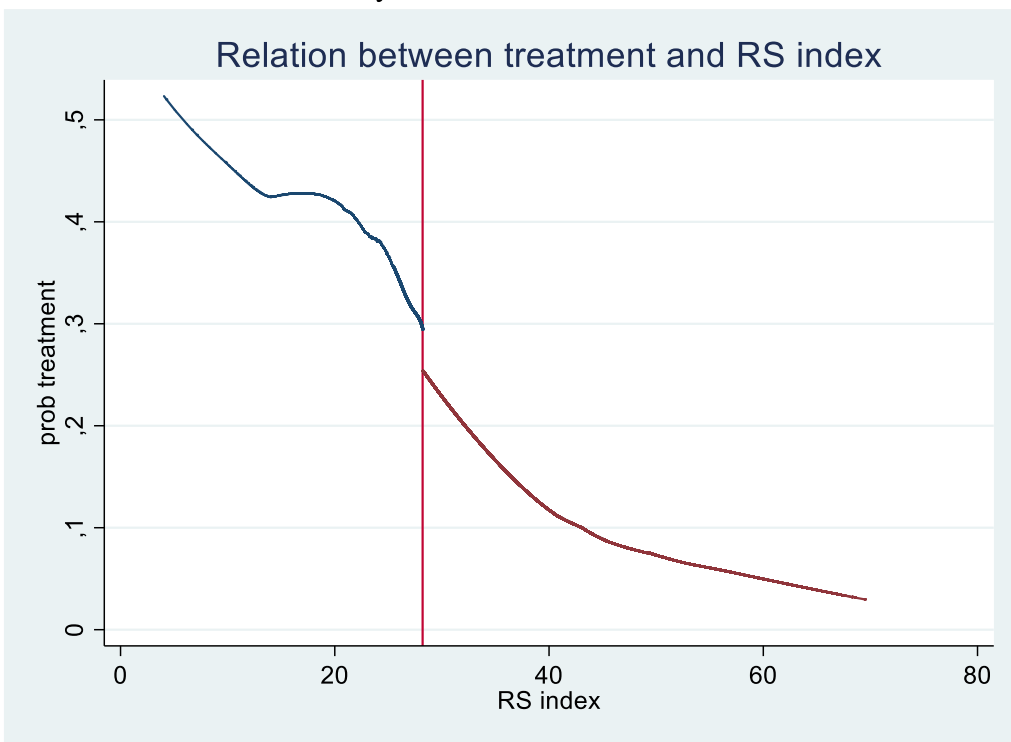
Estimation strategy

- *Program participation: not random*
- *BDH's targeting mechanism (rule)*
- Regression discontinuity (RD) strategy: fuzzy discontinuity → IV

Non-linear relationship between treatment status and the RS index

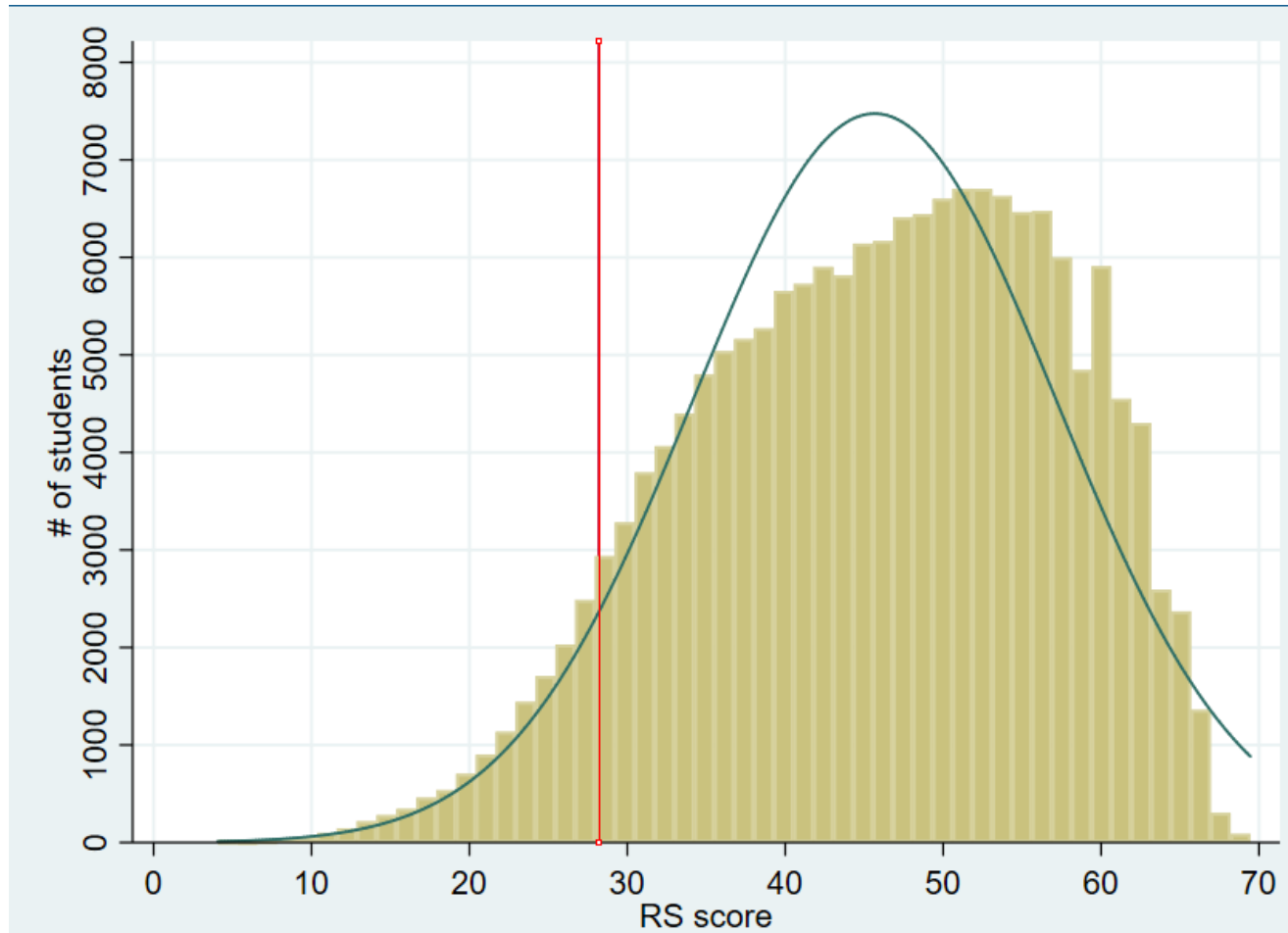


Fuzziness:



Treatment status according to RS index			
	More than 28.2	Less than 28.2	Total
Non-beneficiaries	76.087 94%	4.945 6%	81.032 100%
Beneficiaries	8.351 74%	2.984 26%	11.335 100%
Total	84.438	7.929	92.367

Assumption of no correlation between the instrument and error term



The density of the Selben index does not display signs of discontinuity

Observable+unobservable characteristics:
Similar for those children/households scoring just above and just below the cutoff point

Source: Ser Bachiller data base 2017.

Elaboration: the author

Main summary statistics

	Non-BDH	BDH	Difference
Main characteristics			
Female	0,485 (0,500)	0,472 (0,499)	-0,013** -0,005
Area	0,877 (0,329)	0,753 (0,431)	-0,124*** (0,003)
Private school	0,222 (0,416)	0,0844 (0,278)	-0,138*** (0,004)
Public school	0,712 (0,453)	0,851 (0,356)	0,139*** (0,004)
Time spent traveling to school (minutes)			
Between 15 and 30 minutes	0,404 (0,491)	0,391 (0,488)	-0,012* (0,005)
Between 31 minutes and 1 hour	0,158 (0,365)	0,184 (0,388)	0,026*** (0,004)
More than one hour	0,0422 (0,201)	0,0702 (0,255)	0,028*** (0,002)
Household characteristics			
Number of household members	2,74 (0,797)	2,846 (0,888)	0,106*** (0,008)
Mother's education level			
Basic general education	0,404 (0,491)	0,601 (0,490)	0,197*** (0,005)
Baccalaureate, technical or technological education	0,352 (0,478)	0,213 (0,409)	-0,139*** (0,005)
Third level or higher	0,175 (0,380)	0,0769 (0,266)	-0,099*** (0,004)

Main summary statistics

Cognitive outcomes

	Non-BDH	BDH	Difference
Global score (out of 10)	7,535 (0,804)	7,281 (0,790)	-0,254*** (0,008)
Mathematics (out of 10)	7,287 (0,911)	7,052 (0,884)	-0,236*** (0,009)
Language (out of 10)	8,091 (0,942)	7,769 (0,974)	-0,322*** (0,009)
Natural sciences (out of 10)	7,281 (1,008)	7,046 (1,016)	-0,236*** (0,01)
Social studies (out of 10)	7,476 (0,966)	7,254 (0,978)	-0,222*** (0,01)

Main summary statistics

Non-cognitive outcomes

	Non-BDH		BDH		Difference
About the knowledge acquired in your school:					
The acquired knowledge motivates me to investigate more, develop new ideas and put them into practice	0,399 (0,490)		0,471 (0,499)		0,072*** (0,005)
What is the maximum level of studies you would like to achieve?					
Master's degree	0,336 (0,472)		0,3 (0,458)		-0,036*** (0,005)
How do you consider yourself in mathematics, language, sciences and social studies classes?					
I consider I am an excellent student in mathematics class	0,065 (0,246)		0,044 (0,205)		-0,021*** (0,003)
I consider I am an excellent student in language class	0,112 (0,315)		0,0923 (0,290)		-0,019*** (0,004)
I consider I am an excellent student in sciences class	0,102 (0,302)		0,0822 (0,275)		-0,02*** (0,004)
I consider I am an excellent student in social studies class	0,132 (0,338)		0,105 (0,307)		-0,026*** (0,005)
School attendance					
During the last month in high school, I was never absent for a complete day	0,482 (0,500)		0,512 (0,500)		0,0300*** (0,005)

RDD first stage estimates

Variable	Specification 1	Specification 2
Below cutoff point of 28.2 (Z)	0.086***	0.075***
	(0.01)	(0.01)
N	92367	92028
R ²	0.084	0.093
F-Statistic on excluded instrument	86.85***	65.12***

Note: t statistics in parentheses; * p<0.05, ** p<0.01, *** p<0.001; complete regression tables are in Appendix 5.

Source: AFS 2017.

Elaboration: the author

	Specification 1	Specification 2
<u>Domain</u>	Female student, household's geographic location (urban or rural) and the RS polynomial	Ads variables about the type of school (public or private) and the time spent traveling to school in minutes (between 15 and 30 minutes, between 31 minutes and 1 hour or more than one hour), the number of household members and the mother's education (basic general education, baccalaureate-technical or higher level)

RDD second stage: IV estimates

Estimates for attendance

	Attendance	Attendance
	(1)	(2)
BDH student	0.405***	0.400***
	(0.14)	(0.14)
N	92021	91865
R-sqr		

Note: t statistics in parentheses; + p<0.10, * p<0.05;
complete regression tables are in Appendix 6.

Source: AFS 2017.

RDD second stage: IV estimates

Estimates for cognitive outcomes

	Global Score	Global Score
	(1)	(2)
BDH student	-0.343+	-0.352+
	(0.18)	(0.21)
N	92367	92028
R²	0.081	0.109

	Mathematics	Mathematics	Language	Language	Sciences	Sciences	Social Studies	Social Studies
	(1)	(2)	(1)	(2)	(1)	(2)	(1)	(2)
BDH student	-0.373+	-0.440+	-0.309	-0.243	-0.488*	-0.536+	-0.199	-0.186
	(0.20)	(0.24)	(0.23)	(0.26)	(0.24)	(0.28)	(0.23)	(0.27)
N	92367	92028	92367	92028	92367	92028	92367	92028
R²	0.061	0.076	0.084	0.111	0.040	0.055	0.046	0.066

Note: t statistics in parentheses; + p<0.10, * p<0.05; complete regression tables are in Appendix 7.

Source: AFS 2017.

Elaboration: the author

RDD second stage: IV estimates

Estimates for non-cognitive outcomes

	Motivation	Motivation	Expected Level	Expected Level
	(1)	(2)	(1)	(2)
BDH student	0.064	0.056	-0.187	-0.193
	(0.14)	(0.14)	(0.12)	(0.12)
N	91592	91427	92148	91999
R-sqr	0.016	0.017	.	.

	Esteem-Math	Esteem-Math	Esteem-Lang	Esteem-Lang	Esteem-Sci	Esteem-Sci	Esteem-Soc	Esteem-Soc
	(1)	(2)	(1)	(2)	(1)	(2)	(1)	(2)
BDH student	-0.228*	-0.258*	-0.294*	-0.327*	0.051	0.047	-0.127	-0.141
	(0.10)	(0.10)	(0.13)	(0.14)	(0.11)	(0.12)	(0.13)	(0.14)
N	46162	46071	46153	46062	46162	46069	46166	46074
R-sqr		.	.	.	0.004	0.010	.	.

Note: t statistics in parentheses; + p<0.10, * p<0.05; complete regression tables are in Appendix 7.

Source: AFS 2017.
Elaboration: the author



Conclusion

- The BDH has a positive impact on beneficiaries' attendance which gives continuity to the wide set of findings of the positive impact of the program on children's school attendance.

Though the attendance outcome is affected by the transfer, it is not translated into better academic achievements:

- The BDH has a negative impact on the general Ser Bachiller score.
- The mathematics score is influenced negatively which is related with the impact found for the academic self-esteem on mathematics.
- BDH beneficiaries are not expecting to achieve a higher education level than the one they are applying for (undergraduate education).
- There is not impact for the motivation outcome

- Though this finding is not related with better school performance, the fact that adolescents are attending school reduces the probability of engaging in risky situations (alcoholism, drug addiction, teenage pregnancy, etc.).
- BDH cash transfer generate dependency feelings towards the government's social assistance which is not motivating beneficiaries to improve their living conditions.
- The findings of this study show that beneficiaries are only attending school, which was claimed by Wolf et al. (2012) as the main effect of cash transfers on adolescents, but it is not translated into better achievements, more motivation or expectations which are the most important elements to improve their conditions and a more conscious solution to reduce inequality gaps and break the cycle of poverty.

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THANKS!