

The best way to measure women's agency using just five questions

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Why measure women's agency?

- ▶ It is often valuable to measure women's agency
 - ▶ Does an intervention increase women's agency?
 - ▶ Does women's agency moderate how successful an intervention's is?
- ▶ Agency = Ability to affect one's life by having power to make choices and to control acquired resources

How do you choose which survey questions to use?

- ▶ Option 1: Use validated, thorough module such as WEAI
- ▶ Option 2: Choose a few questions in ad hoc way
- ▶ Our alternative: New validated, short module
 - ▶ Useful when agency is of secondary interest
 - ▶ Common questions that researchers can supplement with others

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- ▶ Goal #1: New module for women's agency
 - ▶ Goal #2: New method for designing survey modules by combining machine learning and semi-structured interviews (MASI)

Methodological innovation for designing the survey module

- ▶ Choose questions that are most strongly correlated with “gold standard” measure of the construct, i.e., women’s agency
- ▶ Gold standard: Semi-structured interviews
- ▶ Also tried using lab game but did not work well

Data collection

Study carried out among women in Haryana, India

- ▶ Collected data in 21 villages in Kurukshetra district in Haryana from February to May 2019
- ▶ Conducted both quantitative surveys and qual interviews with 210 married women
- ▶ Sample averages: 30 years old, married 10 years, 10 years of education, youngest child age 5



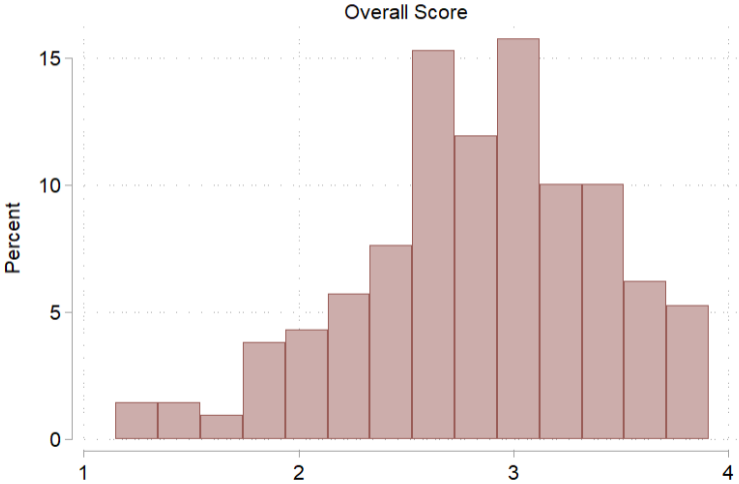
Quantitative survey had closed-ended questions about agency

- ▶ Ask a long list (64) close-ended or quantitative survey questions
- ▶ Goal was to include the common questions used by researchers (but not be so redundant as to frustrate survey respondents)
- ▶ Questions drawn from several existing measurement tools
 - ▶ Relative Autonomy Index questions (Ryan and Deci 2000)
 - ▶ Demographic and Health Survey
 - ▶ Questions from J-PAL Toolkit on measuring women's agency
 - ▶ Sexual Relationship Power Scale (Pulerwitz et al. 2000)

Semi-structured interviews serve as “gold standard”

- ▶ Conducted by 3 interviewers trained in qualitative methods
- ▶ On average 45 minutes long
- ▶ Followed a guide covering 6 domains: Education, Fertility, Mobility, Health, Household expenditures, and Work
- ▶ Then transcribed and coded up using qualitative coding methods

Histogram of women's agency based on semi-structured interviews



Statistical analysis

Selecting questions that best match the “gold standard” measure

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 - ▶ Run LASSO on 50% subsamples 1000 times
 - ▶ Best variables are the ones most often chosen by LASSO

Selecting questions that best match the “gold standard” measure

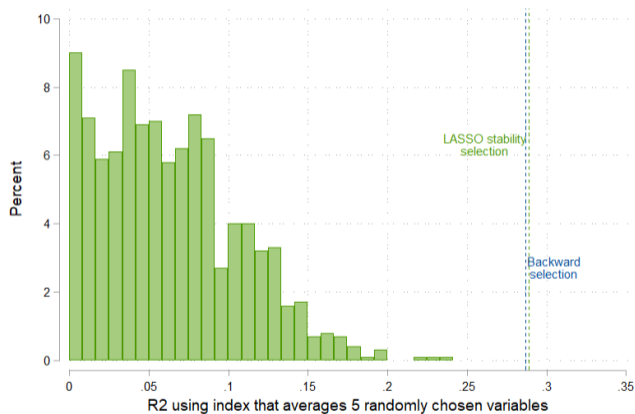
- ▶ The goal is prediction, as with standard machine learning
- ▶ Main difference: We specify the number of variables to include
- ▶ Method 1: LASSO stability selection
 - ▶ Run LASSO on 50% subsamples 1000 times
 - ▶ Best variables are the ones most often chosen by LASSO
- ▶ Method 2: Backward selection
 - ▶ Starting with all 64 variables, delete one and calculate the R^2 when Y is regressed on standardized index of remaining 63
 - ▶ Permanently delete the variable that led to smallest loss of R^2
 - ▶ Repeat to trim set from 63 to 62 vars; keep going until 5 questions are left

New 5-question survey module

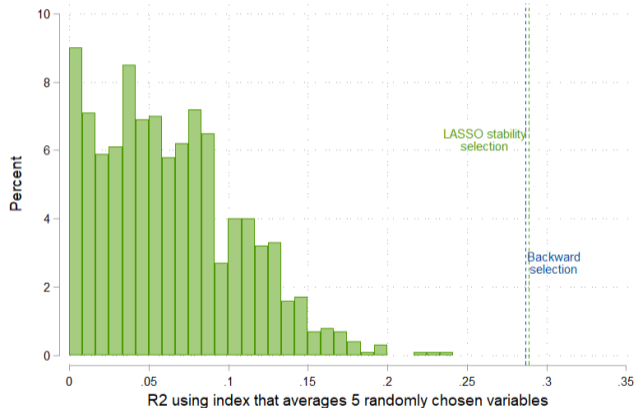
Proposed survey questions to use

Question	LASSO stability selection	Backward selection
Opinion heard when expensive item like a bicycle or cow is purchased?	1	2
Need permission from other household members to buy clothing for self?	2	1
Allowed to buy things in the market without asking partner?	3	
Are you permitted to visit women in other neighborhoods to talk with them?	4	4
Who do you consult with for decisions regarding your children's health care?	5	
Allowed to go alone to meet your friends for any reason?		3
Who in hhld decides to pay school fees for a relative from your side of family?		5
5-Question Index R^2	0.2888	0.2867
5-Question Multivariate Regression R^2	0.2896	0.2893

Index performs well compared to benchmarks



Index performs well compared to benchmarks



Another benchmark:
If use principal component of all 64 questions as index, $R^2 = 0.23$

Conclusions

- ▶ Takeaway #1: Can use this new module for women's agency in surveys
- ▶ Takeaway #2: This new method for developing validated measures can be applied elsewhere
 - ▶ We would like to piggyback on other field projects to replicate what we did
 - ▶ Method can also be applied when trying to select quantitative indicators of complex concepts

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Comments welcome!
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Extra slides

Coding tree example for mobility

1

- ▶ Has restrictions imposed by husband or family members in stepping out
- ▶ Needs explicit permission to step out
- ▶ Always goes accompanied by someone
- ▶ Does not go independently to ANY of: school, hospital, natal village, bank, shopping

2

- ▶ Has same restrictions as for category 1
- ▶ But the woman resists, e.g., goes outside to talk to a friend without permission even though she is “supposed to” get permission
- ▶ Or questions the restrictions put on her

3

- ▶ Some mobility: Is allowed to go some places but not others (e.g., kirana shop, or anywhere in village, to the main road to pick up her children from school)

4

- ▶ Does not have restrictions imposed by husband or family members in stepping out
- ▶ Does not need explicit permission to step out
- ▶ Can go independently to all of: school, hospital, natal village, bank, shopping, both inside and outside village

Frequency that top questions are selected using LASSO stability

Question	Percent of times selected
Opinion heard when expensive item like a bicycle or cow is purchased?	86.8
Need permission from other household members to buy clothing for self?	76.8
Allowed to buy things in the market without asking partner?	75.7
Are you permitted to visit women in other neighborhoods to talk with them?	62.8
Who do you consult with for decisions regarding your children's health care?	59.4
Allowed to go alone to meet your friends for any reason?	58
Are you permitted to visit any place riding on public transport?	57.4
Can decide by self to purchase emergency medicine for child	55.4
When husband has different opinion, voice opinion and argue more often than voice opinion but do as he says	53.2
In last 12 months, how often you and husband discussed children's expenses	50.8

→ [Back to results](#)

Correlation between indices and domain-level qualitative scores

	Qual interview agency score	LASSO stability selection 5-Q Index	Backward selection 5-Q Index	Fertility score	Education score	Health score	HH Expenses score	Mobility score	Work score
Qual-interview agency score	1.000								
LASSO stability selection 5-Q Index	0.535	1.000							
Backward selection 5-Q Index	0.537	0.817	1.000						
Fertility score	0.341	0.199	0.237	1.000					
Education score	0.662	0.296	0.262	0.088	1.000				
Health score	0.631	0.281	0.312	0.132	0.416	1.000			
HH Expenses score	0.710	0.441	0.437	0.097	0.364	0.363	1.000		
Mobility score	0.696	0.338	0.358	0.005	0.306	0.357	0.526	1.000	
Work score	0.467	0.313	0.283	0.140	0.156	0.027	0.079	0.142	1.000

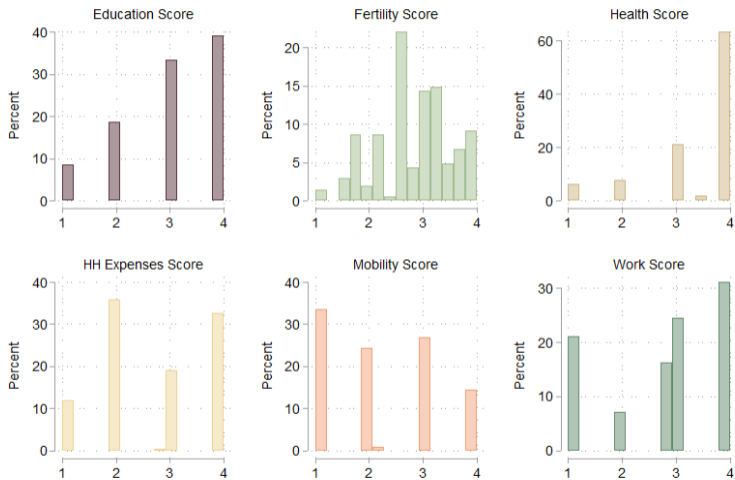
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Correlation between agency measures and individual traits

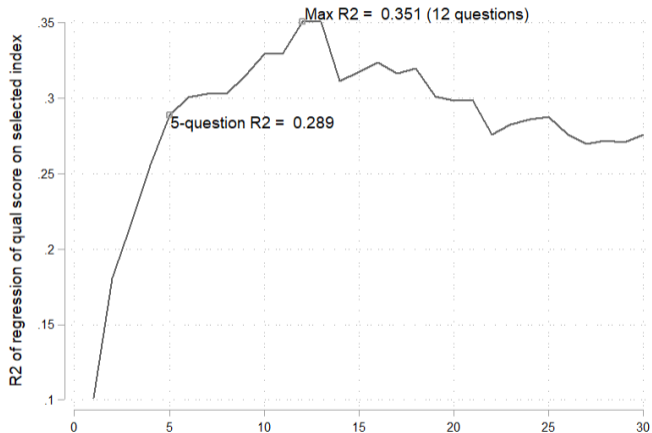
	Qual interview agency score	LASSO stability selection 5-Q Index	Backward selection 5-Q Index	Less than 8 years of education	Age at marriage	Age gap (Husband-wife)
Qual-interview agency score	1.000					
LASSO stability selection 5-Q Index	0.535	1.000				
Backward selection 5-Q Index	0.537	0.817	1.000			
Less than 8 years of education	-0.039	-0.094	-0.162	1.000		
Age at marriage	-0.064	-0.012	-0.020	-0.349	1.000	
Husband-wife age gap	0.053	0.019	0.039	0.132	-0.249	1.000

→ [Back to results](#)

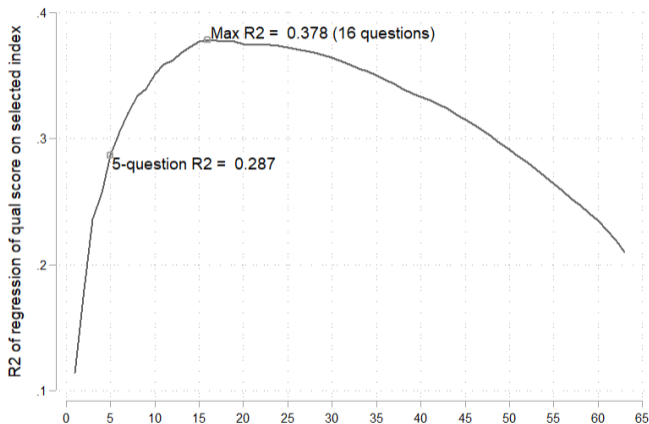
Distribution of agency scores from interviews, by domain



How much gain from using more questions? (LASSO stability)



How much gain from using more questions? (Backward selection)



Distribution of WTP to receive money personally

