Why are women more effective at public goods provision when they work in women's groups?

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February 4, 2017

Summary

- Development aid org's and state agencies in low-income countries frequently choose whether to implement development projects at community level through either **mixed gender** or **same gender** (typically all women) groups.
- In some areas there has been some preference, or theoretical or normative arguments, for working through women's groups.
  - eg, Duflo (2012): "Micro-credit schemes, for example, have been directed almost exclusively at women."

Summary

- The logic/rationale for these decisions is not always completely spelled out.
- But may have to do with any of
  1. Desire to **promote gender equality**.
  2. Perception that women are **better stewards of resources** to be used for public goods than are men.
  3. Perception that women have **greater motivation to use resources on behalf of children** than men.

Summary

- Some previous work finds that women contribute more to public goods/collective action when interacting in all women groups.
  - E.g.: Greig and Bohnet "Exploring Gendered Behavior in the Field with Experiments: Why Public Goods Are Provided by Women in a Nairobi Slum." *Journal of Economic Behavior & Organization*, 2009.
- They found that women contributed more in simple pub goods game when playing with all other women vs 1/2 men 1/2 women.

Summary

Our paper . . .

- In the context of an RCT evaluation of a DfID-funded, IRC-implemented Community-Driven Reconstruction program in two districts of northern Liberia, we . . .
- implemented an orthogonal treatment that randomly assigned whether 24 randomly selected adults in each of 83 villages were either **all women** or **mixed**, meaning 12 women and 12 men.
- The 24 played a "real life" public goods game in which they privately chose how much of a 300LD ($\approx$\$5) endowment to contribute to a community fund, knowing that we would later match indiv contributions at rates of 100% and 400% (indiv's knew their own "interest rate").

Summary: Main results

1. We found that in the allW communities – where game players knew that all other players were women – they contributed on average 84% of the total possible, as compared to 75% in the mixed communities (12 male, 12 female players).
2. This was **not** because women contributed more than men in both conditions.
3. Rather, women contributed about the same as men in the mixed groups, but substantially more **when they knew they were playing with other women only**.

avg % of 300LD contributed		
	women	men
allW	82.3	
mixed	73.6	75.2

Summary

- Goal of paper is to try to explain this pattern.
- We use surveys of the game players (after their contrib decisions) and a structural model to try to estimate the different weights participants put on different considerations in three different "conditions":
  1. Women players in the allW communities.
  2. Women players in the mixed communities.
  3. Male players in the mixed communities.

Summary

- Main finding (we think!): Women in allW seem to have had higher value for contributing **independent of** value for the public good; concerns about matching others' contributions; or fear of discovery/punishment.
- We think best explanation is that many participants thought this was a test of community-spiritedness, and that women in allW condition put more weight on signaling to us that they were "good."
- This may be result of a **social identity effect** – stronger identification with, or motivation to act, when thinking of selves as part of "Team Women of the Village" than as "random village members."

Outline

1. Background, context, game.
2. Gender composition (treatment) effects on contributions. Other main effects.
3. Model of individual decision problem, and estimation (problems).
4. Results, conclusion.

Background

- Way back in early 2000s we partnered with Int'l Rescue Committee, who wanted a rigorous evaluation of their CDR programming.
- Designed an RCT for a DfID-funded IRC CDR program that was implemented in northern Liberia from 2006-2008.
- We randomly assigned the CDR program to 43 of 82 possible communities.

Background

- Main goal of CDR program was **post-conflict democratic institution building at the local-level to increase social cohesion/coll action capacity**.
  - Premise that civil war had destroyed local institutions and/or made for a lot of bad blood, thus need for means of working together for reconstruction.
- We evaluated the impact of CDR with
  1. pre and post surveys, and
  2. a "real life" collective action problem intended to test whether the CDR program affected village ability to raise funds for a community project (thus a measure of social cohesion).

Background

The results of the CDR evaluation were published as

- "Can Development Aid Contribute to Social Cohesion After Civil War? Evidence from a Field Experiment in Post-Conflict Liberia" (Fearon, Humphreys, and Weinstein, *AEA P&P* 2009) and (finally!)
- "How Does Development Assistance Affect Collective Action Capacity? Results from a Field Experiment in Post-Conflict Liberia" (Fearon, Humphreys, Weinstein, *APSR* 2015).

Background

- Out of interest and also bec of doubts about whether CDR program would have measurable impact, we had built another treatment into the design: The **gender composition treatment**.
- Interested in how gender composition might affect collective action capacity, given the sorts of choices that development and gov't agencies are often face in project design.
- Note: We did not have resources/power to have an "allMen" set of communities. Very unfortunate.

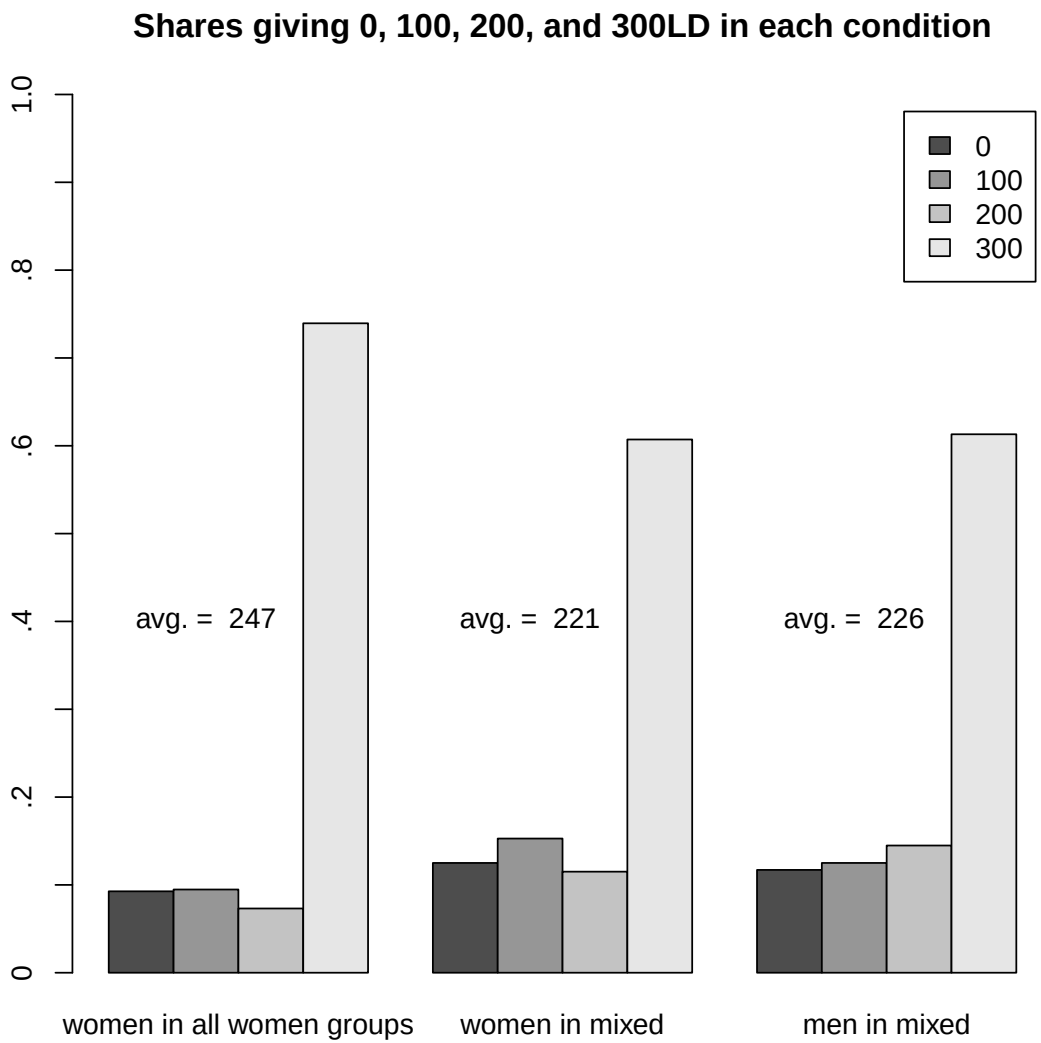
The real-life (ie not in a lab) collection action problem

- Community meeting at which we explained that community members could receive up to $420 to spend on a development project. Money received depends on:
  - How much money a random sample of 24 people contributed to the project in a community-wide public goods game.
  - Community must complete form indicating how the money would be spent and which three people would handle the funds ("comm reps").
- **One week later**, team returns to village, collects form, samples 24 households, plays the public goods game, publicly counts the contributions, announces total, and provides the money to the three community reps.
- Note village had a week to spread news/organize/discuss game, but didn't know ex ante who would be picked to play.

Game protocol in more detail

- Gender-composition treatment:
  - "Mixed": In 42 villages 12 men/12 women randomly chosen to play contribution game.
  - "AllW": In the 41 other villages, 24 women randomly chosen.
- Each player given 300LD in 100s ($4.75) to contribute to the community fund. Indiv decision made in private.
- 12 indivs had contributions multiplied by 2, other 12 by 5 (randomly assigned *interest rate treatment*).
- Surveys conducted with each indiv after s/he played.

Main results



Main results

	all players	women only
Avg contrib in Mixed	223.09	220.65
allW treatment effect	24.58	27.02
se	8.15	9.66
p value	0.0026	0.0052
n.players	1968	1464
N.villages	82	82

se's clustered by village.

Other interesting patterns: Interest rates.

Women responded to the interest rate treatment in both allW and mixed. Men did not, at all.

Mean contrib's by interest rate multiplier

	multiplier		
	2	5	intst rate effect
allW	235	259	23.73
women in mixed	210	231	20.82
men in mixed	225	226	1.14

Other interesting patterns: Expectations.

- Our survey asked (inter alia) about how respondent expected others to contribute.
- On average see overoptimism, marginally more so in mixed than allW.
- Expectations are correlated with actual giving, so women in allW correctly predict that women in allW will give more.

Table: Expectations given different treatments (means)

	W in allW	W in mixed	M in mixed
Exp. avg amt given by others	273	259	255
Actual avg given by others	247	223	223
Avg optimistic overshoot	26	36	32
% predict women would give more than men	83	73	48

How to explain these patterns?

Simple linear model of game player i's decision problem, choosing contribution $x_i \in \{0, 1, 2, 3\}$:

$$u(x_i) = \underbrace{\left(\sum_{j \neq i} r_j x_j + r_i x_i \right)}_{\text{total LD raised}} - \underbrace{\gamma_i (x_i - \rho_i E_i)^2}_{\text{matching motivation}} + \underbrace{\phi_i q_i x_i}_{\text{punishment fear}} + \underbrace{\alpha_i x_i}_{\text{value for own use/signaling motivation}}$$

- We have **data** on x_i, r_i (randomly assigned), E_i, q_i.
  - x_i is observed contribution.
  - $r_i \in \{2, 5\}$ is i's interest rate multiplier.
  - $E_i \in [0, 3]$ is survey-based measure of i's expectation of others' mean contrib.
  - $q_i \in [0, 1]$ is survey-based measure of i's concern that contrib is not anonymous.
- **Parameters**: γ_i, ρ_i, ϕ_i, α_i.

Decision problem for i

$$u(x_i) = \underbrace{\left(\sum_{j \neq i} r_j x_j + r_i x_i\right)}_{\text{total LD raised}} - \underbrace{\gamma_i (x_i - \rho_i E_i)^2}_{\text{matching motivation}} + \underbrace{\phi_i q_i x_i}_{\text{punishment fear}} + \underbrace{\alpha_i x_i}_{\substack{\text{value for own} \\ \text{use/signaling} \\ \text{motivation}}}$$

- First term is total raised by village. Note value for public good is normalized to 1 relative to other considerations.
- Parameters (relative to value for public good/total raised):
  - $\gamma_i > 0$ is weight on matching ρ_i times what others are doing.
  - $\rho_i > 0$ sets i's match target, **and/or** can be a "boast" parameter.
  - ϕ_i is weight on fear of punishment (q_i measure of fear of nonanonymity).
  - α_i **can be negative or positive** and combines i's value for own use of money and any motivation to contribute that is independent of public good, matching, or punishment motivations.

Estimating motivations

- Call the parameters $\beta_i = (\gamma_i, \rho_i, \phi_i, \alpha_i)$ i's **motivations**.
- We want to compare average motivations across three "conditions": Women in allW, Women in Mixed, Men in Mixed.
    1. $mean(\beta_i)_{i \in allW} - mean(\beta_i)_{i \in mixedW}$ can be interpreted as treatment effects of allW gender composition vs mixed on women participants.
    2. $mean(\beta_i)_{i \in allW} - mean(\beta_i)_{i \in mixedM}$ and $mean(\beta_i)_{i \in mixedW} - mean(\beta_i)_{i \in mixedM}$ are interesting comparisons.

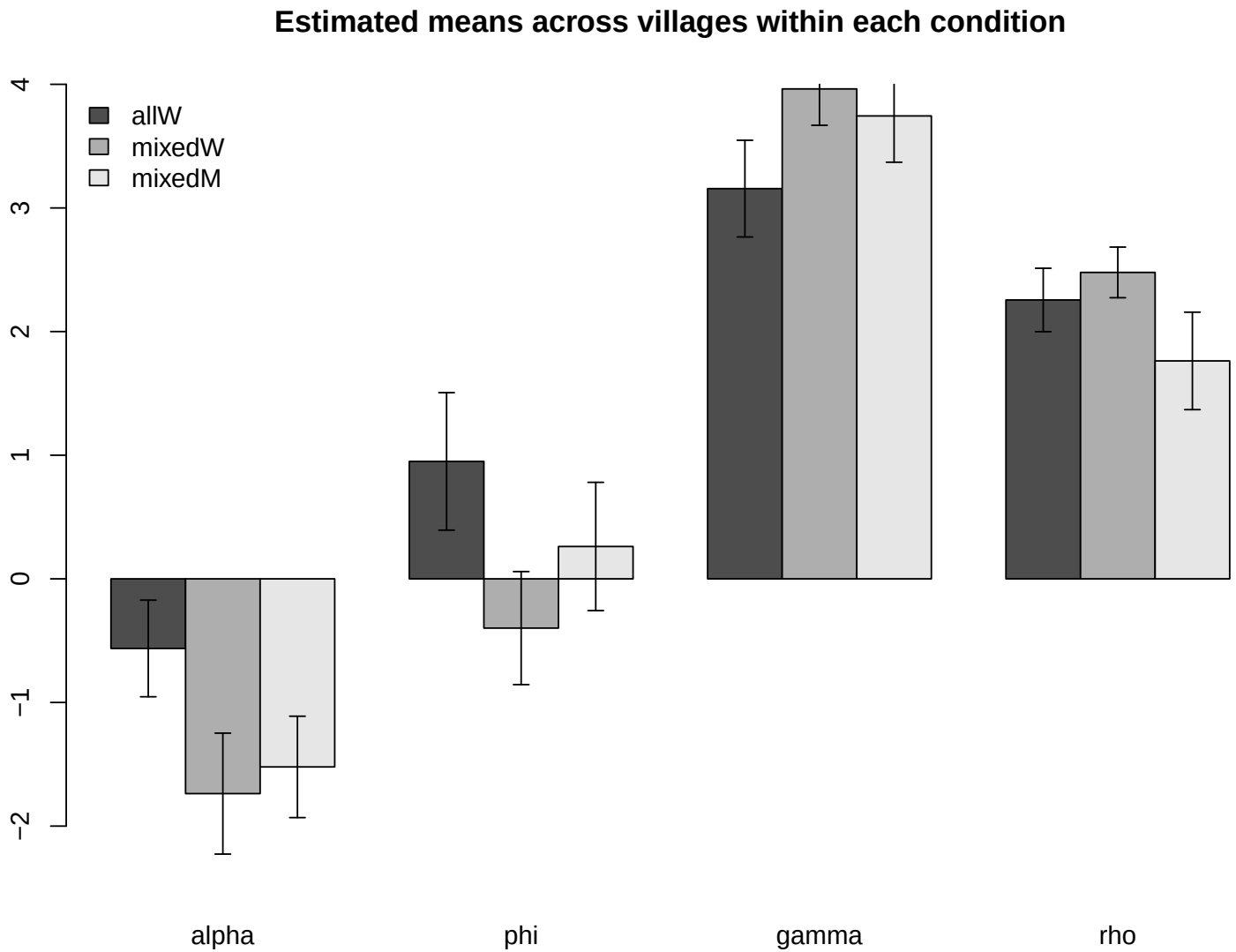
Estimating motivations

$$u(x_i) = \underbrace{\left(\sum_{j \neq i} r_j x_j + r_i x_i\right)}_{\text{total LD raised}} - \underbrace{\gamma_i (x_i - \rho_i E_i)^2}_{\text{matching motivation}} + \underbrace{\phi_i q_i x_i}_{\text{punishment fear}} + \underbrace{\alpha_i x_i}_{\substack{\text{value for own} \\ \text{use/signaling} \\ \text{motivation}}}$$

General approach:

1. Assume some of these are constant w/i condition and village – γ, ρ, ϕ.
2. Assume α_i is a random variable that varies across individuals within communities, with condition-specific mean α and sd σ for each village.
3. Then can derive likelihood that i chooses each x_i for given parameters $(\gamma, \rho, \phi, \alpha, \sigma)$ and data (x_i, r_i, E_i, q_i), under assumption that i is maximizing $u(x_i)$.
4. Use Bayesian model (stan) to try to estimate parameters for each of the 83 villages, then take averages by condition.

Some results: Mean comparisons



Some results: Mean comparisons

- In all conditions, substantial concern *relative to value for public good* on
  1. γ: Value for matching what others are expected to do.
  2. ρ: Estimate suggests average desire to do *more* than what others are doing. Odd?
- Women in allW condition:
  1. α: Put more weight on contributing indep of other considerations (signaling to us?) relative to own use for the money.
  2. ϕ: Concern about non-anonymity (being discovered) as motivation for giving appears greater than for women in mixed.

Some results: Mean comparisons, statistical significance

	mixedW	allW	allW treatment effect	p value
α	-1.74	-0.56	1.17	0.04
ϕ	-0.40	0.95	1.35	0.08
γ	3.96	3.16	-0.81	0.14
ρ	2.48	2.26	-0.22	0.64

$\alpha =$ value for own use/signaling

$\phi =$ non-anonymity concern

$\gamma =$ matching motivation

$\rho =$ match target

t tests

Some field observations . . .

- At community meetings in allW, when we explained that only women could be chosen to play, often saw women at the meeting be noticeably pleased and perhaps proud.
- People often interpreted what we were doing as giving them **a test of community spiritedness**. Possibly thought that if they raised a lot of money, we would bring more.
- Conjecture based on estimation results and these observations: In allW, women felt that they were representatives of **The Women of the Village**, and this was more motivating than thinking of selves as just any members of the village.
- It could also be that women have stronger network connections so that in allW had more concern that poor overall performance would lead to more social "punishment" (whereas in mixed women would not be seen as specifically responsible as women).

Conclusions and implications? (speculative)

- We do not find evidence here that women are unconditionally more inclined to contribute/participate in collective action in support of community goods. Rather, conditional on working with other women, not men.
- Intriguing, but what does it mean? Possibly a social identity effect.
- Implications?
  - Could appeals to (essentially) pride of identity groups – in particular women – be used to motivate participation, contributions in development some development projects?
  - Clearly tricky, as one doesn't want to create or worsen divisions. Eg from Jessica Gottlieb, "Why Might Information Exacerbate the Gender Gap in Civic Participation? Evidence from Mali." *World Development* 2016.
  - But to some extent much dev programming does this implicitly already.

More on estimating motivations: A Bayesian model with some pooling across villages

We have also tried a random-effects-like approach that assumes some parameters are the same across villages within a condition, and others are random effects.

- Assume γ_c, ρ_c, σ_c are homogeneous within condition $c \in \{allW, mW, mM\}$ (ie same across villages).
- Let α_{cv} and ϕ_{cv} vary across villages v and conditions c.

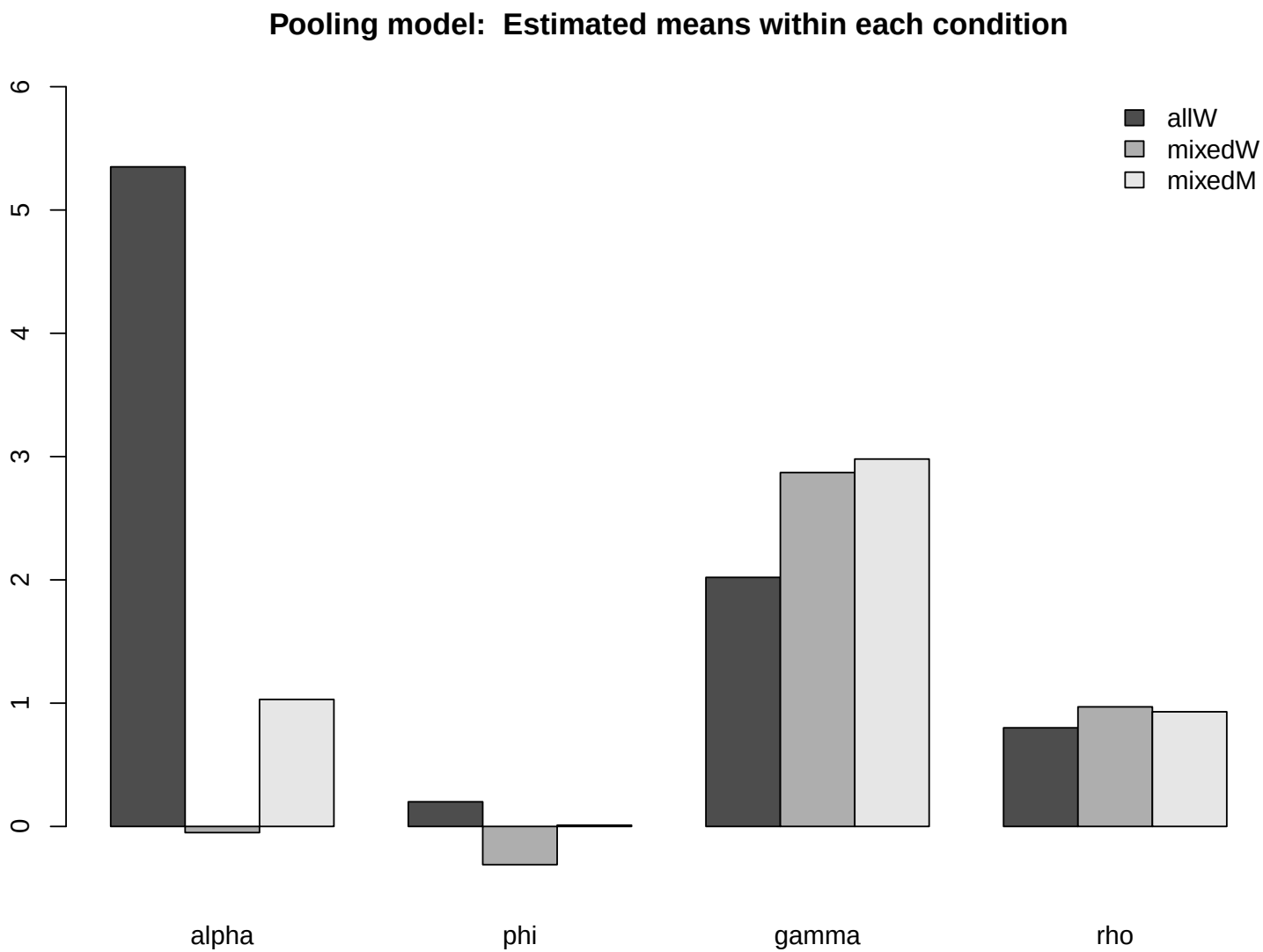
A Bayesian model with some pooling across villages

In particular:

- $\alpha_{cv} = \alpha_v + \alpha_c$ where $\alpha_v \sim N(0, \nu_\alpha)$
- $\phi_{cv} = \phi_v + \phi_c$ where $\phi_v \sim N(0, \nu_\phi)$

Thus we allow random effects for α and ϕ and add parameters ν_α and ν_ϕ to the set of parameters to be estimated. We estimate using a hierarchical Bayesian model (in Stan).

Basic results with pooling model



Basic results with village by village model