Nimble RCTs
A Powerful Methodology in the Program Design Toolbox

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Challenge

A = Designing the right program or policy

B = Implementing the chosen program or policy well

Success = A \times B
What goes into “B”?

Suppose a program is selling something (immunizations, savings accounts, rainfall insurance, mobile money, etc.)

Good marketing (text, testimonial, channel, color, etc)

Right pricing

Offer timed on the right day

Offer timed at the right time

Offer sold to the right person in the household
Not-so-Nimble

Can be good

Can be not-so-good
Nimble

Can be good

Can be not-so-good
Outline

- What Are Nimble RCTs?
- Uses
- Pros & Cons
- Basic Requirements for Successful Testing
- Examples
  - What can go right
  - What can go wrong
- Conclusion:
  - Some Guiding Principles: The Goldilocks CART
What Are Nimble RCTs?
Nimble RCTs...

• AKA rapid fire or A/B tests
• Short-term outcomes
• Often operational questions like take-up (buying, accepting, messaging, clicking, viewing)
• Typically use administrative data
• Key distinguishing features:
  • Faster than traditional RCTs
  • Cheap (if no surveys involved), maybe even negative cost
  • Operational focus (typically)
What Can You Measure with a Nimble RCT?

• Short-term outcomes for which good administrative data is available, such as:
  • Product take-up
  • Program enrollment
  • Attendance
  • Adherence

i.e., outcomes that are earlier or “higher-up” in the theory of change
Example of a Theory of Change:

Figure 1: Nutrition for All’s Theory of Change

**NEEDS**
- Severe malnutrition in children caused by a lack of calories and insufficient nutrients

**ACTIVITIES**
- Train CHWs to identify
- Enroll malnourished children in NFA program
- Provide monthly nutrition supplements & training to families
- Monthly follow-up visits track nutrition status

**OUTPUTS**
- Trainings are conducted
- Malnourished children identified
- Families enroll in the program
- Families receive supplements and advice on nutrition

**OUTCOMES**
- Families adopt improved nutrition practices
- Families serve children NFA food supplements
- Rates of childhood malnutrition drop

*The organization and its theory of change are fictional.*
Key Point

RCTs can be done badly.

And so can Rapid-fire RCTs.

What makes an RCT bad??

• Technical mistakes (not random; too small sample; poor measurement)
• Theoretical mistakes (no attention to “why”, black-box questions)
How Do Nimble RCTs Differ from Traditional RCTs?

<table>
<thead>
<tr>
<th></th>
<th>Rapid-Fire RCTS for Product Design</th>
<th>Welfare Impact RCTs</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Intervention</strong></td>
<td>Usually a <strong>low-cost modification</strong> to an existing product</td>
<td>A modification to an existing product or an entirely new product.</td>
</tr>
<tr>
<td><strong>Data Sources</strong></td>
<td>Largely <strong>administrative</strong> (internal databases such as usage logs, transaction histories or click rates)</td>
<td>Administrative &amp; <strong>survey</strong> (including household survey collection)</td>
</tr>
<tr>
<td><strong>Outcomes</strong></td>
<td>Limited to first-order outcomes like <strong>take-up and usage</strong> of the product in question</td>
<td><strong>Welfare</strong> outcomes such as income or consumption, as well as usage of complementary and substitutable products</td>
</tr>
</tbody>
</table>
Pros & Cons
Pros

- Credible insights into program design
- Quick results and highly actionable data
- Relatively low cost
- Useful first step
Cons

- Limited outcomes measurement
- Limited ability to generate knowledge
- Small effect sizes
- They usually require large samples
Basic Requirements

• A program or service that can be varied
• The right question (actionable)
• Sample size (large)
• Data systems (credible data; not all admin data are)
• Analytic capacity
Examples: What can go right

- Jams
- Loan marketing
- Savings reminders
From which set would you choose?
Jams: The results

Jams: The results

More choices or fewer choices?

Dear [Name],

Congratulations! As a valued client, you are eligible for a special interest rate loan. This is a limited time offer so please come in by 31 October 2003 to apply.

Enjoy low monthly repayments with this offer! For example:

<table>
<thead>
<tr>
<th>LOAN AMOUNT</th>
<th>LOAN TERM</th>
<th>MONTHLY REPAYMENT</th>
</tr>
</thead>
<tbody>
<tr>
<td>R2000</td>
<td>6 MONTHS</td>
<td>R200.56</td>
</tr>
</tbody>
</table>

There are no hidden costs. What you see is what you pay.

How to apply:

Bring your ID book and latest payslip to your usual branch at 27 Church Street Pietersonburg, by 31 October 2003.

Yours sincerely,

[Signature]

Branch Manager

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27 Church Street
Pietersonburg
Tel: 021 645 6630

WE SPEAK ZILU

the trusted way to borrow cash

25 September 2003

Shop 5B, Pinetown Arcade
Pinetown 3800
Tel: 031 717 8550

A special rate for you.

Congratulations! As a valued client, you are now eligible for a special interest rate on your next cash loan from [Bank Name]. This is a limited time offer, so please come in by 31 October 2003.

You can use this cash to buy an appliance, or for anything else you want.

Enjoy low monthly repayments with this offer! For example:

<table>
<thead>
<tr>
<th>Repayment</th>
<th>4 Months</th>
<th>6 Months</th>
<th>12 Months</th>
</tr>
</thead>
<tbody>
<tr>
<td>R1000</td>
<td>R145.85</td>
<td>R168.28</td>
<td>R336.56</td>
</tr>
<tr>
<td>R2000</td>
<td>R291.70</td>
<td>R336.56</td>
<td>R673.13</td>
</tr>
<tr>
<td>R4000</td>
<td>R583.40</td>
<td>R673.13</td>
<td>R1346.27</td>
</tr>
</tbody>
</table>

Loans available in other amounts. There are no hidden costs. What you see is what you pay.

If you borrow elsewhere you will pay R200.14 more in total on a R1550.00, 4 month loan.

How to apply:

Bring your ID book and latest payslip to your usual branch, by 31 October 2003 and ask for Mrs. Gloria Dismani.

Yours sincerely,

[Signature]

Customer Consultant

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Unfortunately, if you have already taken a loan since the date this letter was issued, you do not qualify for this offer.

Congratulations!
IPA partnered with Colpensiones and the National Planning Department

**Main Question**
Can an SMS campaign encourage low income informal workers to save more into their voluntary retirement accounts (BEPS)?

**When**
From September to December 2016, after Colpensiones launched a nationwide Lottery to incentivize participation in the BEPS program

**Sample size**
175,750 BEPS users received SMS (at least one a month, up to four), the remaining 245,720 users formed the control group

**Design**
Sample divided into twenty treatment groups, each receiving a combination of saving reminder and lottery incentive messages
Wave 1 Results: Any Message

**Active users**
Messages greatly enhanced saving behaviors, leading to:
- More frequent deposits (+62%)
- More deposited (+42%)

**Inactive users**
Messages were not particularly effective in convincing users to save for the first time. Although, in the case they did, newly activated users:
- Deposited more frequently (+75%)
- More deposited (+5%)
Wave 1 Results: Different Messages

**Frequency for Active Users:**

1 message: # of deposits up 4.5%
2 messages: # of deposits up 151%
4 messages: # of deposits up 19%

**Frequency for Inactive Users:**

1 message: # of deposits up 57%
2 messages: # of deposits up 79%
4 messages: # of deposits up 64%

**Content**

Combining reminders with lottery incentive messages produced the higher impact:

- 82% increase in the number of deposits
- 56% increase in the amount deposited
During 2017-2018, IPA will continue to work with Colpensiones to run three additional experimental waves to:

1. Replicate and unpack the Wave 1 frequency result
2. Evaluate new strategies targeted at inactive users
3. Examine the persistence of the Wave 1 effects
4. Test design variations of the BEPS annual statement

A similar partnership with CONSAR in Mexico will test the impact of a similar design on a higher-income and more formal population.
What Can Go Wrong

- **Technical:** Bad randomization, sample size, poor measurement, etc.
  - Example: Peru, re-randomized monthly bank messages for repayment
- **Theoretical:** Package A versus Package B problem
  - Example: USDA marketing letters for micro-loans for farmers in the USA
Dear [Name],

Why am I getting this letter?

We at the Farm Service Agency (FSA) are approaching farmers in your area to encourage farmers like you to learn more about microloans: direct farm operating loans of up to $50,000 designed to meet the needs of farmers like you in smaller, non-traditional, and niche-type operations.

Your microloan can help you grow your farm by purchasing livestock, feed, farm equipment, fuel, farm chemicals, and insurance and covering other operating costs, including living expenses.

Thousands of farmers like you find microloans are the right fit for their farms – microloans have:

- Only one short application document. (Applicants must qualify)
- Streamlined balance sheet & credit requirements.
- Experience and production record requirements designed for farmers like you.
- No minimum loan amount – and up to $50,000.
- No down payment required.

FSA officers are here to help you prepare and submit your application with one-on-one assistance – contact your local office today and make this season a fresh start.

Happy farming!

Val Dolcini
Administrator
USDA Farm Service Agency


USDA is an equal opportunity employer

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Dear [Name],

Why am I getting this letter?

We at the Farm Service Agency (FSA) are approaching farmers in your area to encourage women like you to learn more about microloans: direct farm operating loans of up to $50,000 designed to meet the needs of farmers in smaller, non-traditional, and niche-type operations.

Thousands of women have found microloans to be the right fit for their farms and have received loans totaling over $50 million to help grow their farm. Microloans have:

- No minimum loan amount – and up to $50,000.
- No down payment required.
- Only one short application document. (Applicants must qualify)
- Streamlined balance sheet & credit requirements.
- Experience and production record requirements designed for farmers like you.

FSA officers are here to help you prepare and submit your application with one-on-one assistance – contact your local office today and make this season a fresh start.

Happy Farming!

Val Dolcini
Administrator
USDA Farm Service Agency

P.S. Check out the microloan fact sheet at [www.fsa.usda.gov/micro]. Don’t miss out on an opportunity that has helped other women farmers! ¿Habla español? [www.fsa.usda.gov/micro_es]

USDA is an equal opportunity employer
2015
• Agricultural Census (NASS)
• Zip code level randomization
• Sent to all primary operators in a treatment zip code
• Regional
• Blocked by state and decile of targeted population

2016
• SCIMS (FSA)
• Individual level randomization
• National
• Sent to female operators
• Spillover design
## Results

### Table 1—Regression results

<table>
<thead>
<tr>
<th>Dependent variable = 1 if Borrowed under program</th>
<th>Experiment 1</th>
<th>Experiment 2</th>
</tr>
</thead>
<tbody>
<tr>
<td>Direct effect of treatment</td>
<td>0.00056404***</td>
<td>-0.00006748</td>
</tr>
<tr>
<td></td>
<td>(0.000167)</td>
<td>(0.0001183)</td>
</tr>
<tr>
<td>Control in treated county (spillover effect)</td>
<td>--</td>
<td>-0.0001437</td>
</tr>
<tr>
<td></td>
<td></td>
<td>(0.0001184)</td>
</tr>
<tr>
<td>Constant</td>
<td>2.21E-16***</td>
<td>0.001323**</td>
</tr>
<tr>
<td></td>
<td>(5.39E-17)</td>
<td>(0.0001699)</td>
</tr>
<tr>
<td>N</td>
<td>285,147</td>
<td>548,546</td>
</tr>
</tbody>
</table>
Conclusion: Nimble RCTs

- A powerful methodology in the program and product design toolbox
- A rigorous and cost-saving measure
- A great way to adapt an evidence-backed program in a new context/with a different population
- A way to improve design through effective tweaks (not a way to measure overall programmatic impact).

- A complement, not substitute for welfare-measuring RCTs
The Goldilocks Challenge
CART Principles

Credible
• Do the findings accurately answer the question?

Actionable
• Do you have a plan for all possible reasonable outcomes from the data?

Responsible
• Will the data generate enough guidance to warrant the expense?

Transferable
• Can the findings be applied to other organizations?
Thank you!

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Yale University
Innovations for Poverty Action
M.I.T. Jameel Poverty Action Lab
Examples from IPA’s Portfolio

**Text messages from bank → savings deposits & balances:** Varied gain/loss, mention of goal, etc.

**Text messages from bank → repayment of loans**
- **Success:** Philippines. Including Account Officer name → higher repayment
- **Failure:** Peru. Messed up randomization, re-randomized individuals each month

**Listening rates of messages in Liberia:** Testing listening rates of different audio messages aimed at reducing intimate partner violence as preliminary “lab” work

**Mobile money take-up in Pakistan:** Worked with Pakistan’s leading mobile money provider, Telenor Easypaisa, to explore ways to increase adoption and usage of the mobile money among unbanked poor
Appendix
## Wave 1 Research Design

<table>
<thead>
<tr>
<th>Saving Reminder SMS</th>
<th>Message type</th>
<th>Personalized</th>
<th>Social Comparison</th>
<th>Generic</th>
<th>Control (no Lottery SMS)</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Standard BEPS (no change)</td>
<td>3,650 Active 7,000 Inactive</td>
<td>3,650 Active 7,000 Inactive</td>
<td>3,650 Active 7,000 Inactive</td>
<td>2,000 Active 2,000 Inactive</td>
</tr>
<tr>
<td></td>
<td>Social comparison</td>
<td>3,650 Active 7,000 Inactive</td>
<td>3,650 Active 7,000 Inactive</td>
<td>3,650 Active 7,000 Inactive</td>
<td>2,000 Active 2,000 Inactive</td>
</tr>
<tr>
<td></td>
<td>Generic reminder</td>
<td>3,650 Active 7,000 Inactive</td>
<td>3,650 Active 7,000 Inactive</td>
<td>3,650 Active 7,000 Inactive</td>
<td>2,000 Active 2,000 Inactive</td>
</tr>
<tr>
<td></td>
<td>Call to the future</td>
<td>3,650 Active 7,000 Inactive</td>
<td>3,650 Active 7,000 Inactive</td>
<td>3,650 Active 7,000 Inactive</td>
<td>2,000 Active 2,000 Inactive</td>
</tr>
<tr>
<td></td>
<td>Control (no Savings SMS)</td>
<td>3,650 Active 7,000 Inactive</td>
<td>3,650 Active 7,000 Inactive</td>
<td>3,650 Active 7,000 Inactive</td>
<td>Pure control</td>
</tr>
</tbody>
</table>
## Wave 1 Message Content

<table>
<thead>
<tr>
<th>Personalized (Option 1)</th>
<th>WIN with BEPS lottery! Save $5,000 this week and participate to win a $50,000 DEPOSIT in your BEPS account. Colpensiones 018000410779</th>
</tr>
</thead>
<tbody>
<tr>
<td>Personalized (Option 2)</td>
<td>WIN with BEPS lottery! Save $XXX,XXX[1] more this month and participate to win a MOTORBIKE! Colpensiones 018000410779</td>
</tr>
<tr>
<td>Personalized (Option 3)</td>
<td>WIN with BEPS lottery! Save $XXX,XXX more this year and participate to win an $80 million bonus for the purchase of a HOUSE! Colpensiones 018000410779</td>
</tr>
<tr>
<td>Social comparison</td>
<td>Just as XX,XXX BEPS users already won $50,000 for their BEPS account, you can too WIN by saving weekly through Via Baloto[2]. Colpensiones 018000410779</td>
</tr>
<tr>
<td>Generic</td>
<td>Colpensiones invites you to save every week to participate in BEPS lottery. The more you save the more opportunities you have to win. Colpensiones 018000410777</td>
</tr>
<tr>
<td>Standard BEPS</td>
<td>Get BEPS Life Insurance and funeral protection, Colpensiones invites you to save in BEPS for free. Go to VIA BALOTO and save NOW. Colpensiones 018000410779</td>
</tr>
<tr>
<td>Social comparison</td>
<td>Last month XXX,XXX Colombians saved in their BEPS account, you too can secure your future. Save NOW in VIA BALOTO. Colpensiones 018000410779</td>
</tr>
<tr>
<td>Generic reminder</td>
<td>Colpensiones reminds you: do not forget to SAVE in your BEPS account to protect your future! Go to VIA BALOTO and save NOW. Colpensiones 018000410777</td>
</tr>
<tr>
<td>Call to the future</td>
<td>The future comes sooner than you think! Think about the life you want in your old age and save in BEPS today. Save now in VIA BALOTO. Colpensiones 018000410777</td>
</tr>
</tbody>
</table>