<table>
<thead>
<tr>
<th>Moderator</th>
<th>Using Behavioral Insights in Notice Design to Improve Taxpayer Responses and Achieve Compliance Outcomes</th>
<th>Jan Millard</th>
<th>Jan Millard</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Strategies to Address Noncompliance in Refundable Tax Credits: Evidence on Taxpayer Responses to EITC Correspondence Audits and Experimental Outreach</td>
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<tr>
<td></td>
<td>Federal Tax Liens and Letters: Effectiveness of the Notice of Federal Tax Liens and Alternative IRS Letters on Individual Tax Debt Resolution</td>
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<td>Discussant:</td>
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<tr>
<td>Alex Yuskavage</td>
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<tr>
<td>Treasury, Office of Tax Analysis</td>
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</tbody>
</table>
Using Behavioral Insights in Notice Design to Improve Taxpayer Responses and Achieve Compliance Outcomes

Presented by: Jan Millard

Anne Herlache, IRS (RAAS); Jan Millard, IRS (RAAS);
Alicia Miller, IRS (RAAS); Michelle Theel, IRS (S&E PMO)

IRS TPC Joint Research Conference  |  June 20th, 2018
Using Behavioral Insights in Notice Design to Improve Taxpayer Responses and Achieve Compliance Outcomes

Behavioral Insights
- Foundational Principles of Behavioral Insights (BI)
- Applying BI to Notice Redesign

Notice Redesign
- General Goals & Method
- High-Level Results of the CP14 & LT16 Pilots

Cross-Study Insights
- Benefits and Opportunities
- Strategies
Foundational Principles of Behavioral Insights

We are faced with more decisions and information than we can consciously process.

Our surroundings play a key role in our unconscious behavior.

We are social beings who care what others think and do.

**Behavioral Insights (BI)** uses principles from the behavioral sciences such as psychology, neuroscience, and behavioral economics to understand **how individuals absorb, process, and react to information.**
Applying Behavioral Insights to Notice Redesign

<table>
<thead>
<tr>
<th>Potential BI Elements to Test</th>
<th>Message Focus</th>
</tr>
</thead>
<tbody>
<tr>
<td>Gain framing</td>
<td>Benefits of tax compliance</td>
</tr>
<tr>
<td>Loss framing</td>
<td>Consequences of non-compliance</td>
</tr>
<tr>
<td>Encouragement</td>
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<td>Deadline framing</td>
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<td>Social persuasion</td>
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<td>Personalization</td>
<td>Cater the notice message based on TP traits</td>
</tr>
<tr>
<td>Default option bias</td>
<td>List the most desired outcome first</td>
</tr>
</tbody>
</table>
Notice Redesign Initiative Goals

1) Encourage taxpayers to take payment compliance actions (full payments, partial payments, or installment agreements)

2) Encourage taxpayers to use self-service tools to resolve collection issues without phone calls or mail

3) Reduce IRS cost by decreasing the volume of phone calls and correspondence the IRS receives

4) Promote behavior to reduce the burden experienced by taxpayers, including financial and non-financial costs

Notice redesign has proven to be a cost-effective method for the IRS to increase payment compliance while using IRS resources efficiently.
SBSE Collection Notice Stream

**CP14: Balance Due and Demand for Tax Notice**

FY16: 7.6M
Total $ Amount: $8.40B

The CP14 is the first and most common notice sent to taxpayers. The notice advises the taxpayer that there is a tax due, states the amount of tax, including interest and penalties, and requests payment within 21 days.

**CP501: Reminder Balance Due Notice - Intent to Levy**

FY16: 2.9M
Total $ Amount: $1.34B

The CP501 is the second notice sent five weeks after the CP14 (unless the taxpayer has paid or contacted the IRS). The notice advises the taxpayer that there is tax due, states the amount of tax, including interest and penalties, and requests payment.

**CP503: Important 2nd Balance Due Notice**

FY16: 4M
Total $ Amount: $6.94B

The CP503 is the third notice sent five weeks after the CP501. The notice, sent only to IMF (individual Masterfile) taxpayers, reminds the taxpayer there is a tax due, states the amount of tax, including interest and penalties, and requests payment.

**CP504: Urgent Final Balance Due Notice**

FY16: 4.8M
Total $ Amount: $4.94B

The CP504 is the fourth notice sent five weeks after the CP503. The notice alerts the taxpayer that the IRS intends to levy the taxpayer's state tax refund or other property, and reminds the taxpayer of the amount of tax due including interest.

**LT11: ACS Intent to Levy Notice**

FY16: 832,000
Total $ Amount: $336M

The LT11 is sent five weeks after the CP504 notice if the taxpayer has not taken actions to resolve the matter, and if there are levy and lien possibilities. The LT11 notifies taxpayer of the intent to levy by the IRS.

**LT16: Request for Taxpayer to Contact ACS**

FY16: 866,000
Total $ Amount: 299M

The LT16 is generally sent after the LT11 to request that the taxpayer contact ACS. If there are no levy and lien possibilities, the LT11 is bypassed and the LT16 is sent.
General Notice Redesign Test & Learn Method

Develop **redesigned notices** using **behavioral elements** and input from IRS stakeholders.

Conducted a **Randomized Control Trial** to test the impact of the redesigned notices against a Control.

Track **taxpayer behavior** after notice issuance to determine the behavioral elements with the **greatest impact** on the business outcomes.

Behavioral Elements Examples:

- Fewer pages
- Visuals
- Clear Next Steps
- Easy Online Payments
Notice Redesign: CP14 Method

- **Participants & Sampling**
  - 34,000 taxpayers
  - Randomly assigned to 1 of 4 groups
    - 8500 per group

- **Materials**
  - Control: Standard CP14
  - Prototypes
    - Condensed Notice
    - Minimal Notice
    - Visual Notice

- **Procedure**
  - Incrementally mailed from July 31, 2017 – Oct 30, 2017
  - Tracked taxpayer behavior for 6 weeks after notice issuance

*First page examples of study materials are available in the appendix*
## CP14: High-Level Results

### Improved Payment Compliance

- **All of the redesigned CP14 notices resulted in increases in overall compliance**
  - The Condensed notice improved overall compliance the most
  - The Visual notice resulted in the most dollars collected overall, per notice, and through full payments

<table>
<thead>
<tr>
<th>Notice Type</th>
<th>Increase in Full Payment Compliance</th>
<th>Additional Dollars Collected per Notice</th>
</tr>
</thead>
<tbody>
<tr>
<td>Condensed</td>
<td>6%</td>
<td>$59</td>
</tr>
<tr>
<td>Visual</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

### Increased Self-Service

- Every redesigned CP14 notice led to an increase in the use of self-service channels

- **21% Increase in payments via self-service channels across all redesigned notices**

### Decreased IRS Cost

- With fewer pages per notice than the Control, the redesigned notices may increase cost savings if scaled

<table>
<thead>
<tr>
<th>Cost Savings</th>
</tr>
</thead>
<tbody>
<tr>
<td>Potential mail and print cost savings</td>
</tr>
<tr>
<td>if scaled</td>
</tr>
<tr>
<td>No statistically significant increase in phone calls</td>
</tr>
</tbody>
</table>

- **$1.4-1.7M Potential mail and print cost savings if scaled**

### Decreased Taxpayer Burden

- Every redesigned notice reduced taxpayer penalties

- **3% Decrease in the number of taxpayers with the maximum failure-to-pay penalty**

### The IRS could collect an additional $485M annually if the best performing (Visual) notices were sent to all CP14 taxpayers

*Based on the FY16 population, if scaled*
Notice Redesign: LT16 Method

- **Participants & Sampling**
  - 59,000 taxpayers
  - Randomly assigned to 1 of 7 groups
    - 8,500 per group

- **Materials**
  - Control: Standard LT16
  - Prototypes
    - Minimalist
    - Color
    - Behavioral
    - Urgent
    - Visual
    - Installment Agreement (IA)

- **Procedure**
  - Incrementally mailed from January 31, 2017 – March 6, 2017
  - Tracked taxpayer behavior for 18 weeks after notice issuance

*First page examples of study materials are available in the appendix*
LT16: High-Level Results

**Improved Payment Compliance**

The Urgent & IA notices prompted the greatest increase in compliance, while the Behavioral and Visual notices underperformed.

- The Urgent notice resulted in the most dollars collected overall, per notice, and through full payments.
- The IA notice unsurprisingly resulted in the highest percentage of IAs.

**$63M* Projected increase if Urgent or IA notices were sent to all LT16 recipients**

**10-11% Increase in payment compliance actions (IA & Urgent)**

**$63 Additional dollars collected per notice sent (Urgent)**

**Increased Self-Service**

Every redesigned LT16 notice led to an increase in the use of self-service channels.

13-31% *Increase in payments via self-service channels across all redesigned notices*

**Decreased IRS Cost**

With fewer pages per notice than the Control, the redesigned notices may increase cost savings if scaled.

50% *Decrease paper usage*

8-20% *Reduction in cost per taxpayer case (across all redesigned notices)*

**Decreased Taxpayer Burden**

Urgent & IA notices reduced taxpayer penalties.

6-8% *Decrease in the number of taxpayers with the maximum failure-to-pay penalty (Urgent & IA)*

The IRS could collect an additional $63M annually if either of the best performing (Urgent or IA) notices were sent to all LT16 taxpayers

*Based on the FY16 population, if scaled*
Strategies for Data Deep-Dives & Cross-Study Insights

Drawing **systematic** and statistically **rigorous** insights from within and across different BI-informed pilots

1) Multiple Regression / Segmentation
2) Meta-Analysis
3) Predictive Modeling

**Building a foundation for Behavioral Insights at the IRS**
Multiple Regression / Segmentation

• **Identify relevant taxpayer behavioral characteristics**
  • E.g., balance due, ability to pay, filing status, income type, etc.

• **Explore how pilot treatments perform in different groups**
  • Deeper dives into the data
  • Example from the LT16 Pilot – Behavioral Notice & Balance Due

• **This method notes patterns in importance of predictors across pilots**
  • *Do certain behavioral elements work consistently across certain subpopulations?*

---

Building a foundation for Behavioral Insights at the IRS
Mini Meta-Analysis

- **Identify features for on-going study**
  - E.g., behavioral elements within notices, covariates, etc.

- **Record relevant effect sizes**

- **Aggregate results to gain a deeper understanding**
  - Identify patterns among results (e.g., with specific population segments)
  - Allows for the incorporation of non-IRS studies

- **This method validates insights and reinforces the knowledge base of “what works,” thus supporting broader application**

---

Building a foundation for Behavioral Insights at the IRS
Predictive Modeling

• **Create a risk model**
  • Identify which CP14 recipients are likely to remain in the collection stream and receive an LT16 notice

• **Apply the model to the CP14 pilot**

• **Identify what works among those with high scores**
  • Identify which prototypes are likely to bring taxpayers at risk of remaining in the collection stream to the issuance of an LT16 into earlier compliance.

• *This method enables the application of insights to different taxpayer points of contact, potentially upstream*

Building a foundation for Behavioral Insights at the IRS
Conclusions

Apply **Behavioral Insights** to **Pilot Tests** to address specific business goals.

Use a variety of methods to conduct **Deeper Dives** in our pilot data and draw **Cross-Study Insights** from the BI-informed pilots.

Add to an ever-growing **Centralized Knowledge Base** of Behavioral Insights at the IRS.

---

Building a foundation for Behavioral Insights at the IRS.
Appendix
Applying Behavioral Insights to Notice Redesign

<table>
<thead>
<tr>
<th>Potential changes to be tested</th>
<th>Message focus</th>
<th>Example: TP did not file</th>
<th>Example: TP filed with a Bal Due</th>
</tr>
</thead>
<tbody>
<tr>
<td>Gain framing</td>
<td>Benefits of tax compliance</td>
<td>You can file your past tax returns and gain valuable tax benefits</td>
<td>If you pay your balance today, you will avoid more penalties and interest in the future</td>
</tr>
<tr>
<td>Loss framing</td>
<td>Consequences of non-compliance</td>
<td>If you do not file, you may incur substantial penalties</td>
<td>If you do not pay, your balance will increase by $X due to penalties</td>
</tr>
<tr>
<td>Encouragement</td>
<td>Ease of tax compliance</td>
<td>If you have not already done so, it's easy to file your past tax returns</td>
<td>You can pay your balance online using a credit or debit card</td>
</tr>
<tr>
<td>Deadline framing</td>
<td>Key deadlines for the TP</td>
<td>It is not too late to file your past tax returns; you can file before this date without incurring penalties</td>
<td>Paying before this date will minimize penalties you will have to pay</td>
</tr>
<tr>
<td>Social persuasion</td>
<td>Demonstrate peer TPs are in compliance</td>
<td>X% of your peers are in compliance. You can file your past tax returns to be in compliance too</td>
<td>Even after entering A/R, X% of your peers pay off their debt</td>
</tr>
<tr>
<td>Personalization</td>
<td>Cater the notice message based on TP traits</td>
<td>Over the past X years, you have filed timely</td>
<td>Based on your compliance history, you have managed to make full payments on past debts</td>
</tr>
<tr>
<td>Default option bias</td>
<td>List the most desired outcome first</td>
<td>You can file your returns online or by mail</td>
<td>You can make a payment online at irs.gov/payments, by check or money order, or by phone</td>
</tr>
</tbody>
</table>
CP14 Notice Prototypes & Control (2017 CP14)

“Condensed”
- Closest to current notice
- Includes short descriptions of interest and penalties
- References IA, OIC, and CNC as options for TPs who can’t pay in full
- Maintains balance summary on the front of notice

“Minimal”
- Uses current notice template
- Additional information removed from notice (e.g., OIC/CNC options, penalty/interest descriptions); TPs are directed online instead
- 1st page focuses on payment options and IA; 2nd page focuses on balance details

“Visual”
- Deviates from current template to a more visual format
- 1st page focuses on payment options and IA; 2nd page focuses on balance details; 3rd page offers more information
- Payment stub on last page

“Control” – the current CP14 version for 2017
- Revised BAU notice for 2017
- Contains individual sections for each penalty/interest charge
- Does not mention IAs or other resolution options on first page
LT16 Notice Prototypes & Control

Control Notice

“Minimalist” Notice

“Behavioral” Notice

“Color” Notice

“Urgent” Notice

“Visual” Notice

“IA” Notice
TAX ENFORCEMENT AND TAX POLICY:
Evidence on Taxpayer Responses to
EITC Correspondence Audits

June 2018

John Guyton  Kara Leibel  Day Manoli  Ankur Patel  Mark Payne  Brenda Schafer
IRS        IRS        UT-Austin   Treasury   IRS        IRS

Disclaimer: This research represents the authors' research efforts and does not represent any official views or opinions of the United States Department of Treasury, Internal Revenue Service or any other government agency.
Introduction

• Earned Income Tax Credit (EITC): largest wage subsidy, anti-poverty program in US
  • Health (Strully et al 2010, Evans and Garthwaite 2014, Hoynes et al 2015)
  • Poverty (Hoynes and Patel 2018)

• Concerns about erroneous claims of EITC benefits (Holtzblatt 1991, McCubbin 2000, Blumenthal, Erard and Ho 2005, Leibel 2014)

• Key enforcement tool to protect revenue and deter erroneous claims: EITC correspondence audits

• Little is known about short-term and long-term impacts of EITC correspondence audits and any subsequent loss of benefits on taxpayer behaviors
Introduction

• This project uses random variation inherent in audit procedures to estimate causal impacts of audits on taxpayer behavior, highlight potential areas for improvements in EITC correspondent audit communications

• Research design permits estimation of short-term and long-term impacts from EITC correspondence audits on taxpayer behaviors (claiming EITC benefits, filing tax returns, refunds)

• Research design permits estimation of impacts of losses of EITC benefits from EITC correspondence audit outcomes on labor supply
EITC Correspondence Audit Background

Correspondence audits = audits conducted via mail
verify qualifying child eligibility, self-employment income

Summary of Audit Selection Process (details not made public by the IRS)

- All EITC returns checked to see if any flags are triggered
- If any flags are triggered, return is scored
- Returns with highest risk scores are always audited
- Random selection of returns with lower and intermediate risk scores

Research strategy: compare randomly selected audited returns to returns with similar risk scores that were not selected for audit
Audit Background

Disallowance, Non-Response, & Undeliverable Rates

A. Self-Employed

B. Wage Earners
Impacts of EITC Correspondence Audits

Claiming EITC, Self-Employed

→ Decrease in claiming EITC following audit. Sharpest decline immediately after audit, persists multiple years after audit.
Impacts of EITC Correspondence Audits

Claiming EITC, Wage Earners

Difference
= 0.77 - 0.55
= 0.22

→ Decrease in claiming EITC following audit. Sharpest decline immediately after audit, persists multiple years after audit.
Impacts of EITC Correspondence Audits

Filing

A. Self-Employed

Difference
= 0.78 - 0.48
= 0.30

B. Wage Earners

Difference
= 0.94 - 0.78
= 0.16

→ Decrease in filing accounts for much of decrease in claiming EITC, but also observe decrease in claiming EITC conditional on filing (increase in receipt of CP09/CP27 notices)
Earnings Responses, Dynamics for Self-Employed

For Self-Employed, increase in wage employment (decrease in fraction at $0 wages) is largest 1 year after audit, fades but still persists multiple years after audit.
Earnings Responses, Dynamics for Wage Earners

For Wage Earners, decrease in wage employment (increase in fraction at $0 wages) is largest 1 year after audit, fades but still persists multiple years after audit.
Conclusions

This project: examine how tax enforcement affects taxpayer behavior, use these results to gain insights into how tax policies affect taxpayer behavior

In years after EITC Correspondence Audits:
• Decrease in likelihood of claiming EITC
  • Decrease in likelihood of filing, persistent; accounts for much of changes in EITC receipt, but also observe decrease in likelihood of claiming EITC conditional on filing
  • EITC maximizers respond to EITC correspondence audits similar to non-maximizers
• Wage earnings responses
  • Self-employed increase likelihood of having wage employment
  • Wage earners decrease likelihood of having wage employment
Conclusions

In years after EITC Correspondence Audits:
• Decrease in likelihood of claiming EITC, filing
• Wage employment: increase for Self-Employed, decrease for Wage Earners

Further Research
• Although some of the decrease in EITC claims and reported self-employment income likely results from improved tax compliance, we seek to better understand how to mitigate any unintended negative impacts
• Possible strategies to improve audit communication to taxpayers
• Possible strategies for post-audit follow-up communications with taxpayers
Thank you!!!
Federal Tax Liens and Letters: Effectiveness of the Notice of Federal Tax Liens and Alternative IRS Letters on Individual Tax Debt Resolution

IRS
Research, Applied Analytics and Statistics
Knowledge Development and Application
06/20/2018

Ishani Roy, Brett Collins, Alex Turk, and Alan Plumley
(IRS—Research, Applied Analytics, and Statistics)
Terry Ashley and Jeff Wilson
(IRS—Taxpayer Advocate Service)

Disclaimer: The views in this paper are those of the authors only and do not necessarily reflect the positions of the IRS or the Taxpayer Advocate
Background

- A statutory lien is established when Taxpayer fails to pay a federal tax assessment.
- A Notice of Federal Tax Lien (NFTL) can be filed that will:
  - Make the statutory lien public information.
  - Help to establish priority over other secured creditors.
  - Be in force until all unpaid amounts are resolved.
- NFTLs act as an incentive for taxpayers to pay down outstanding debts, but may also have negative impacts on taxpayers’ credit scores, as tax liens become public information.
- To help IRS decide how much it should use NFTLs and which taxpayers to send them to, it’s important to assess the effectiveness of the NFTLs and whether any alternative treatments might be preferable.
Research Question

- How effective are NFTL and other treatment alternatives at motivating taxpayers to resolve their outstanding debt?
  - Focus on taxpayers with $10K to $25K outstanding balance due

- Taxpayers were randomly assigned to one of five treatment groups, including the control group
  - File standard Notice of Federal Tax Lien
  - Issue Collection Alternative Letter 5696C
  - Issue Reminder Notice 5701C
  - Issue 5701C first, then Monthly Reminder 5702C for nine months if no response
  - Control group with no contact

- Initially tracked case outcomes after 12 months
  - Pilot ran from April 2016-April 2017
## Study Design

<table>
<thead>
<tr>
<th>Pilot Group</th>
<th>Treatment</th>
<th>Number of Taxpayers Selected</th>
</tr>
</thead>
<tbody>
<tr>
<td>Pilot 1</td>
<td>File traditional NFTL</td>
<td>2,996</td>
</tr>
<tr>
<td>Pilot 2</td>
<td>Issue Collection Alternative Letter 5696C</td>
<td>2,564</td>
</tr>
<tr>
<td>Pilot 3</td>
<td>Issue Reminder Notice 5701C</td>
<td>2,571</td>
</tr>
<tr>
<td>Pilot 4</td>
<td>Issue 5701C first, then Monthly Reminder 5702C for up to 9 months if no response</td>
<td>2,583</td>
</tr>
<tr>
<td>Pilot 5</td>
<td>Control group, no additional action taken</td>
<td>2,487</td>
</tr>
</tbody>
</table>

- Completely randomized design, taxpayers assigned by last two digits of TIN
- Study population: 13,201 Individual Master File taxpayers with balance due between $10K-$25K at beginning of the study
- New letters tested in pilot groups 2, 3, and 4 remind taxpayers of their outstanding balance due, including penalties and interest, and provide instructions for making payments, arranging CNC and offers in compromise, contacting TAS, etc.
Characterizing the Sample Population

<table>
<thead>
<tr>
<th>Major Source of Income</th>
<th>Percent of Total</th>
</tr>
</thead>
<tbody>
<tr>
<td>Wages</td>
<td>28.0%</td>
</tr>
<tr>
<td>Self-Employment</td>
<td>36.6%</td>
</tr>
<tr>
<td>Investments</td>
<td>16.7%</td>
</tr>
<tr>
<td>Other</td>
<td>18.7%</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Population Statistics</th>
<th>N=13,201</th>
</tr>
</thead>
<tbody>
<tr>
<td>% With Balance Due Major SOA</td>
<td>49.7%</td>
</tr>
<tr>
<td>% With Prior ACS Letter Contact</td>
<td>57.2%</td>
</tr>
<tr>
<td>Average Number of Modules</td>
<td>2.6</td>
</tr>
<tr>
<td>Median Ratio of Tax Debt to Income</td>
<td>0.32</td>
</tr>
<tr>
<td>Mean Age of Oldest Module (days)</td>
<td>1,341</td>
</tr>
<tr>
<td>Mean Days in ACS Status</td>
<td>220</td>
</tr>
</tbody>
</table>
Empirical Model

- OLS model for change in balance due ($\Delta b$) over the course of the pilot

\[ \Delta b_1 = b_1 - b_0 - \alpha_1 \]

- $b_1 =$Natural log of entity balance for taxpayer at end of pilot
- $b_0 =$Natural log of entity balance for taxpayer at start of pilot
- $\alpha_1 =$Sum of initial module balances for previously identified delinquent returns assessed during the one-year pilot

- Model Change in Balance as

\[ \Delta b_1 = X\beta + \beta_1 T_1 + \beta_2 T_2 + \beta_3 T_3 + \beta_4 T_4 + \varepsilon \]

- $X =$Vector of controls
- $T_1 - T_4 =$Dummy indicators for four treatment groups
Modeling Likelihood of Paying Down Balance

- Ordinal logistic model to assess the chances of a taxpayer belonging to one of three outcome categories:

- Model outcome $R_1$ as

$$R_1 = \begin{cases} 
0, & \text{if } b_1 > b_0 + \alpha_1 \\
1, & \text{if } b_1 \leq b_0 + \alpha_1 \text{ and } b_1 \neq 0 \\
2, & \text{if } b_1 = 0 
\end{cases}$$

- Assume probability of observing a value of $R_1$ determined as follows, where $\phi$ is the logistic cumulative density function

$$P(R_1 = 2) = \phi(aX + a_1T_1 + a_2T_2 + a_3T_3 + a_4T_4)$$

$$P(R_1 = 1) = \phi(aX + a_1T_1 + a_2T_2 + a_3T_3 + a_4T_4 + c) - \phi(aX + a_1T_1 + a_2T_2 + a_3T_3 + a_4T_4)$$

$$P(R_1 = 0) = 1 - \phi(aX + a_1T_1 + a_2T_2 + a_3T_3 + a_4T_4)$$
Control Variables

- Prior ACS contacts
- Ability to pay: Ratio of annual income to balance due
- Major source of assessment
- Previous TDI prior to pilot
- Major source of income (wages, self-employed, etc.)
- Number of modules
- Prior NFTL
- Age of oldest module
- Added when extending analysis beyond first year:
  - Entering installment agreement after first year
  - Currently Not Collectible (CNC) status after first year
### Ordinal Logistic Regression (Response: R)

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Parameter Estimate</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Model</strong></td>
<td></td>
</tr>
<tr>
<td>Year One (b₁ - b₀)</td>
<td></td>
</tr>
<tr>
<td>Two Years (b₂ - b₀)</td>
<td></td>
</tr>
<tr>
<td>Year Two (b₂ - b₁)</td>
<td></td>
</tr>
<tr>
<td><strong>N</strong></td>
<td></td>
</tr>
<tr>
<td>13,201</td>
<td>13,201</td>
</tr>
<tr>
<td><strong>Intercept (R=2 vs. R=0)</strong></td>
<td></td>
</tr>
<tr>
<td>-2.554***</td>
<td>-1.954***</td>
</tr>
<tr>
<td><strong>Intercept (R=1 vs. R=0)</strong></td>
<td></td>
</tr>
<tr>
<td>-0.421***</td>
<td>-0.148</td>
</tr>
<tr>
<td><strong>NFTL</strong></td>
<td></td>
</tr>
<tr>
<td>0.503***</td>
<td>0.452***</td>
</tr>
<tr>
<td><strong>Letter1 (5696C)</strong></td>
<td></td>
</tr>
<tr>
<td>0.100</td>
<td>0.092</td>
</tr>
<tr>
<td><strong>Letter2 (5701C)</strong></td>
<td></td>
</tr>
<tr>
<td>0.110*</td>
<td>0.076</td>
</tr>
<tr>
<td><strong>Letter2_monthly (5702C)</strong></td>
<td></td>
</tr>
<tr>
<td>0.162**</td>
<td>0.178***</td>
</tr>
<tr>
<td><strong>Ltr_LT11</strong></td>
<td></td>
</tr>
<tr>
<td>-0.139**</td>
<td>-0.172***</td>
</tr>
<tr>
<td><strong>Ltr_LT16</strong></td>
<td></td>
</tr>
<tr>
<td>-0.137***</td>
<td>-0.142***</td>
</tr>
<tr>
<td><strong>Ltr_other</strong></td>
<td></td>
</tr>
<tr>
<td>0.001</td>
<td>-0.002</td>
</tr>
</tbody>
</table>
# Multinomial Logistic Regression

## Year One (Response: R)

<table>
<thead>
<tr>
<th>Year One ( (b_1 - b_0) )</th>
<th>( R_1 ) (vs. 0)</th>
<th>Parameter Estimate</th>
<th>( R_1 ) (vs. 0)</th>
<th>Parameter Estimate</th>
</tr>
</thead>
<tbody>
<tr>
<td>Intercept</td>
<td>2</td>
<td>-1.119***</td>
<td>1</td>
<td>-0.803***</td>
</tr>
<tr>
<td>NFTL</td>
<td>2</td>
<td>0.885***</td>
<td>1</td>
<td>0.363***</td>
</tr>
<tr>
<td>Letter1 (5696C)</td>
<td>2</td>
<td>0.238*</td>
<td>1</td>
<td>0.075</td>
</tr>
<tr>
<td>Letter2 (5701C)</td>
<td>2</td>
<td>0.215</td>
<td>1</td>
<td>0.090</td>
</tr>
<tr>
<td>Letter2_monthly (5702C)</td>
<td>2</td>
<td>0.217</td>
<td>1</td>
<td>0.170**</td>
</tr>
<tr>
<td>Ltr_LT11</td>
<td>2</td>
<td>-0.217</td>
<td>1</td>
<td>-0.138**</td>
</tr>
<tr>
<td>Ltr_LT16</td>
<td>2</td>
<td>-0.334***</td>
<td>1</td>
<td>-0.091*</td>
</tr>
<tr>
<td>Ltr_other</td>
<td>2</td>
<td>0.136</td>
<td>1</td>
<td>-0.043</td>
</tr>
</tbody>
</table>
Marginal Treatment Effects for Logistic Models

<table>
<thead>
<tr>
<th>Treatment</th>
<th>Marginal Effect Ordinal Models</th>
<th>Marginal Effect Multinomial Models</th>
</tr>
</thead>
<tbody>
<tr>
<td>Model</td>
<td>(vs. R=0)</td>
<td>R=2</td>
</tr>
<tr>
<td>Year 1 (b_1-b_0) R_1</td>
<td>NFTL</td>
<td>0.034</td>
</tr>
<tr>
<td></td>
<td>Letter 1 (5696C)</td>
<td>0.011</td>
</tr>
<tr>
<td></td>
<td>Letter 2 (5701C)</td>
<td>0.010</td>
</tr>
<tr>
<td></td>
<td>Letter 2 monthly (5702C)</td>
<td>0.014</td>
</tr>
</tbody>
</table>

- NFTL group roughly 11 percentage points likelier to fully or partially pay down balance after one year compared with control

- Calculations for letter treatments suggest they are about one third to one half as effective, though this may not be significant for all models
## Linear Regression (Response: $\Delta b$)

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Parameter Estimate (standard error)</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Model</strong></td>
<td><strong>Year One</strong> $b_1 - b_0$</td>
</tr>
<tr>
<td>N</td>
<td>13,201</td>
</tr>
<tr>
<td>Intercept</td>
<td>-1.537***</td>
</tr>
<tr>
<td>NFTL</td>
<td>-0.548***</td>
</tr>
<tr>
<td>Letter1 (5696C)</td>
<td>-0.112</td>
</tr>
<tr>
<td>Letter2 (5701C)</td>
<td>-0.080</td>
</tr>
<tr>
<td>Letter2_monthly (5702C)</td>
<td>-0.111</td>
</tr>
<tr>
<td>Ltr_LT11</td>
<td>0.085</td>
</tr>
<tr>
<td>Ltr_LT16</td>
<td>0.151***</td>
</tr>
<tr>
<td>Ltr_other</td>
<td>-0.081*</td>
</tr>
</tbody>
</table>
### Case Status as of mid-March 2018 (% by Pilot Group)

<table>
<thead>
<tr>
<th>Pilot</th>
<th>NFTL</th>
<th>5696C</th>
<th>5701C</th>
<th>5701C &amp; 5702C</th>
<th>Control</th>
</tr>
</thead>
<tbody>
<tr>
<td>Queue or Shelved*</td>
<td>35.9%</td>
<td>41.6%</td>
<td>42.6%</td>
<td>48.4%</td>
<td>42.8%</td>
</tr>
<tr>
<td>Installment Agreement</td>
<td>14.8%</td>
<td>12.8%</td>
<td>13.5%</td>
<td>14.9%</td>
<td>11.8%</td>
</tr>
<tr>
<td>Resolved</td>
<td>14.2%</td>
<td>9.7%</td>
<td>9.9%</td>
<td>9.7%</td>
<td>7.9%</td>
</tr>
<tr>
<td>ACS or Field</td>
<td>25.7%</td>
<td>28.2%</td>
<td>25.6%</td>
<td>19.1%</td>
<td>30.2%</td>
</tr>
<tr>
<td>CNC (other than shelved)</td>
<td>3.6%</td>
<td>2.3%</td>
<td>2.5%</td>
<td>2.1%</td>
<td>2.1%</td>
</tr>
<tr>
<td>Other</td>
<td>5.8%</td>
<td>5.4%</td>
<td>6.0%</td>
<td>5.9%</td>
<td>5.2%</td>
</tr>
</tbody>
</table>

*Many cases transferred to the Queue with more than one third of statutory period expired were shelved (starting in January 2017) to make them available for Private Debt Collection*
Comparison with Prior Work

<table>
<thead>
<tr>
<th>Impact of NFTL (one year)</th>
<th>Predicted % Change in Balance Due</th>
<th>Average $ Change</th>
</tr>
</thead>
<tbody>
<tr>
<td>Lien Pilot Study (IMF)</td>
<td>-55%</td>
<td>-$7,701</td>
</tr>
<tr>
<td>“Fresh Start” Study—IMF</td>
<td>-23%</td>
<td>-$3,379</td>
</tr>
<tr>
<td>“Fresh Start” Study—BMF</td>
<td>-40%</td>
<td>-$4,103</td>
</tr>
</tbody>
</table>

- Prior studies of the same population using the 2011 “Fresh Start” threshold increase found about half the impact in terms of reduce unpaid balances for the IMF cases.
- Different economic conditions during the 2011 “Fresh Start” study and the current 2016 pilot
  - Great Recession
  - Different levels of enforcement activity
- The pilot study does not include BMF cases
  - Larger impact for BMF in Fresh Start Study
Conclusions

• The impact of the NFTLs is roughly 3-5 times larger than any of the letter treatments
• Letter treatments appear to yield positive, though smaller effects, but are not statistically significant in many cases
• Prior ACS letters correlate with less debt reduction, likely because prior treatment encouraged compliance and remaining cases selected for pilot are more difficult to resolve
  • Supports the idea that it’s important to use lower-cost treatments prior to filing NFTL
• NFTL estimates consistent with prior study of changes in NFTLs filing following the 2011 “Fresh Start”
Behavioral Responses to IRS Interventions

Alex Yuskavage
Office of Tax Analysis
Intro

• Three great examples of how government research can be done
  • Benefits to the public, to agencies, and to academia

• Behavioral and experimental studies
  • Let us choose the questions
  • Observe real-world outcomes
Spectrum of Studies

• Identification typically requires randomization somewhere

• Range of sources
  • Lab Experiment
  • Field Experiment
  • Quasi-Experiment
  • Natural Experiment
  • Observational Study
Pitfalls to Experimental Studies

• Economists are used to justifying our choice of data source
  • Issues of endogeneity, saliency, etc.

• Experimental studies let us create our own data
  • Is this better? Worse? Just different?

• What are the tradeoffs?
  • There are always tradeoffs
Notice Design Setup

• Various IRS notices given several possible redesigns
  • Redesigns based on specific behavioral elements
• New designs assigned randomly to letter recipients
• Several dimensions of response measured
  • Compliance
  • Self-service
  • Burden
  • Costs
Notice Design Results

• What did we learn?
  • Which letter works best?
  • Which design principles matter?
  • Which taxpayer characteristics matter?

• Making the most of a randomized study
  • What tradeoffs are worth making?
  • Sample considerations
  • Factor considerations
Lien Letters Setup

• Notices about tax liens redesigned

• Notice recipients assigned randomly to different treatments

• Change in balances measured
  • Outcomes decomposed to generalize treatment effects
Lien Letters Results

• Why these treatments?
  • Possibility frontier of treatments

• Which decompositions are most helpful?
  • Decomposing total outcome
  • Decomposing effect of treatment
EITC Audits Setup

• Audits of medium-risk EITC recipients compared to rest of medium-risk population

• IRS internal risk scores used to construct control groups

• Several outcomes measured
  • Tax filing behavior
  • Real labor effects
EITC Audits Results

• What do we know about risk scores?
  • How are they used?
  • How much tax taxpayers guess?
  • Does it matter?

• How can we characterize exactly what we’re randomizing on?
Limits of Experimentation

• Is RCT a “Gold Standard”?
  • Yes and No...
  • What is being randomized? How?

• Ethics of experimentation
  • Don’t repeat past mistakes
  • Neglecting treatment?
  • Causing harm?
Conclusion about papers

• Contact with agencies matters
  • Audits, contacts have noticeable effects

• Method of contact with agencies matters
  • Along some margins, small changes can have large effects

• Lots of ground left to cover
  • All three studies are clearly opening the door to interesting work
Conclusion about experiments

• Issues to consider in experimental studies
  • Taking advantage of your randomization
  • Determining your ideal goal
  • Identifying your source of randomness

• Careful design has benefits
  • Address complicated issues
  • Use resources optimally
  • Fulfil multiple goals
## Session 2. Behavioral Responses to IRS Interventions

**Moderator:** Darw Johns  
**IRS, RAAS**

<table>
<thead>
<tr>
<th>Topic</th>
<th>Speaker</th>
<th>Affiliation</th>
</tr>
</thead>
<tbody>
<tr>
<td>Using Behavioral Insights in Notice Design to Improve Taxpayer Responses and Achieve Compliance Outcomes</td>
<td>Jan Millard</td>
<td>IRS, S&amp;E PMO</td>
</tr>
<tr>
<td>Strategies to Address Noncompliance in Refundable Tax Credits: Evidence on Taxpayer Responses to EITC Correspondence Audits and Experimental Outreach</td>
<td>Day Manoli</td>
<td>University of Texas-Austin</td>
</tr>
<tr>
<td>Federal Tax Liens and Letters: Effectiveness of the Notice of Federal Tax Liens and Alternative IRS Letters on Individual Tax Debt Resolution</td>
<td>Brett Collins</td>
<td>IRS, RAAS</td>
</tr>
</tbody>
</table>

**Discussant:** Alex Yuskavage  
**Treasury, Office of Tax Analysis**
8th Annual IRS/TPC Joint Research Conference on Tax Administration

Keynote address begins at 1:00
Keynote Speaker

Eric Solomon
Codirector of National Tax Services,
Ernst & Young LLP
Session 3. Complexity and Global Tax Administration

The next session will begin immediately.