Invisible treatments: placebo and Hawthorne effects in development programs

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Invisible treatments...why bother?

- If perceptions and reactions explain a significant part of measured intervention impacts then...
- ..we are over-stating impact of ‘the intervention’, so
  - There may be more cost-effective ways of attaining impacts
  - Sustainability of impacts and scaleability may be at risk
Study objectives

• Systematically review the identified placebo and Hawthorne effects in effectiveness-studies of development interventions

• Systematically analyse possible sources and consequences of placebo and Hawthorne effects in selected development sectors

• identify the level of recognition of the effects among evaluators
A Placebo is...

- **From medicine:**
  - ...any therapy prescribed for its therapeutic effects, but which actually is ineffective or not specifically effective for the condition being treated
  - A **placebo effect** is the non-specific therapeutic effect produced by a placebo

- **Generalized:**
  - ...an effect that results from the belief in the treatment rather than the treatment itself
  - ...a neutral treatment that has no "real" effect on the dependent variable
  - a participant's positive response to a placebo is called the **placebo effect**

- To **control for the placebo effect**, researchers administer a neutral treatment (i.e., a placebo) to the control group (e.g. sugar pill)
Hawthorne effect is...

- An effect that results from the awareness of being studied, rather than from the treatment per se
- ...when behavior changes as a result of a subject responding to being treated and observed, as part of an experiment
- Term originates from experiment in Hawthorne plant in the 1924

Possible causal mechanisms:
- attention makes the subject feel better
- attention causes the subject to reflect on treatment-related aspects, and reflection causes performance improvements
- the experimental situation provides subjects with performance feedback and this extra information allows improvements

*John Henry effect* is a specific form of Hawthorne effect
- occurs when the participants in the control group alter their behavior out of awareness that they are in the control group e.g. support teacher
Other related effects

- **Survey effect**: survey respondents are influenced by the survey process, thereby confounding estimates of parameters of interest
  - Increase attention to or awareness of subject
  - A survey makes neglected needs or opportunities more salient and spurs a more active decision (Zwane et al; 2011)

- How to distinguish survey effect from Hawthorne effect:
  - Disguise/conceal the fact that subjects are being studied
    - No follow-up survey (e.g. use administrative data)
    - And/or make subjects believe there is no follow-up survey
    - Survey team separate from research team
    - Qualitative studies eliciting reasons for survey respondents responding in certain ways (Barnes, 2010)

- Experimenter effects; response bias etc..
Placebo vs Hawthorne

- Both are psychological effects (perceptions and reactions) of the participants, causing an effect even when the material intervention has no effect
- Placebo effect is the participants' false belief in the material efficacy of the intervention
- Hawthorne effect is the participants' response to being studied i.e. to the human attention.
Objective 1: review of identified P&H effects

**Study selection criteria:**

- High quality quantitative effectiveness studies explicitly recognising possible placebo and Hawthorne effects

- Articles will be selected that:
  - report specific social and economic development-related interventions;
  - are conducted in developing (low- or middle-income) countries;
  - estimate placebo and Hawthorne effects directly; and/or
  - discuss the possible existence of Hawthorne and/or placebo effects in the interpretation of results

- Clinical trials will be excluded
Search approach

• Search of IE databases:
  – 3ie, DIME, J-PAL: 306 IE studies (no duplicates)
  – IFPRI: 1249 studies (caveat: search engine)

• Bibliographic search

• Survey sent to 3ie expert database
  – 580
  – 14 responses (2.4%)
## Search results

<table>
<thead>
<tr>
<th></th>
<th>Database</th>
<th>Expert survey (additional)</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td>Placebo</td>
<td>6</td>
<td>2</td>
<td>8</td>
</tr>
<tr>
<td>Econometric placebo</td>
<td>7</td>
<td>1</td>
<td>8</td>
</tr>
<tr>
<td>Erroneous use (placebo)</td>
<td>2</td>
<td>0</td>
<td>2</td>
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<tr>
<td>Hawthorne</td>
<td>6</td>
<td>5</td>
<td>11</td>
</tr>
<tr>
<td>Other respondent effects</td>
<td>n.a.</td>
<td>3</td>
<td>3</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td><strong>21</strong></td>
<td><strong>11</strong></td>
<td><strong>32</strong></td>
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</table>
Placebo results

• Of the 18 studies that discussed placebo effects
  – 8 were placebo controlled
  – 0 estimated the placebo effect
  – 8 used the term in a different sense (robustness check)
  – 2 used it wrongly (for control)

• Sectors:
  – nutrition/health (iron, Anthelmintic, Albendazole treatments, nutritional supplement)
  – water and sanitation (chlorination tablets; hygienic storage vessels)
  – financial (placebo financial follow-up visits)

• Systematic review found large effects of water treatment on diarrhea in non-blinded studies which was not present in the few properly blinded studies, possibly in part due to the placebo effect (Cairncross et al, 2010)
<table>
<thead>
<tr>
<th>Authors</th>
<th>Country</th>
<th>Sector</th>
<th>Intervention</th>
<th>Study design</th>
<th>Effect estimates</th>
</tr>
</thead>
<tbody>
<tr>
<td>Drexler et al; 2010</td>
<td>Dominican Republic</td>
<td>Financial</td>
<td>Financial training for microentrepreneurs; classroom based versus home-visit add-on</td>
<td>RCT Control group received placebo follow-up visits</td>
<td>++</td>
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<td>Placebo/ Hawthorne estimate: N/A</td>
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<tr>
<td>Stoltzfus et al; 2004</td>
<td>Zanzibar</td>
<td>Nutrition/health</td>
<td>Iron supplementation and mebendazole for treatment of iron deficiency and helminth infections</td>
<td>randomized, placebo controlled, double-blind trial</td>
<td>Iron’s effect on anemia limited; mebendazole ++</td>
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<td>Placebo/ Hawthorne estimate: N/A</td>
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<tr>
<td>Kirwan et al; 2010</td>
<td>Nigeria</td>
<td>Nutrition/health</td>
<td>Anthelmintic treatment for Plasmodium infection in preschool children</td>
<td>randomized, placebo controlled, double-blind trial</td>
<td>++</td>
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<td>Simeon et al; 1995</td>
<td>Jamaica</td>
<td>Nutrition/health/education</td>
<td>Albendazole treatment of Trichuris trichiura Infections</td>
<td>randomized, placebo controlled, double-blind trial</td>
<td>School performance effect in children with heavy infections; weight gain effect in children with lighter infections</td>
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<td>Placebo/Hawthorne estimate: N/A</td>
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<td>Maluccio et al; 2006</td>
<td>Guatemala</td>
<td>Nutrition/health/education</td>
<td>Early childhood nutrition intervention (food supplementation) for improving growth and cognitive development</td>
<td>RCT Control group received placebo drink (no energy content)</td>
<td>Cognitive effects/edu ++</td>
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<td>Jain et al; 2008</td>
<td>Ghana</td>
<td>WSS/nutrition/health</td>
<td>In-house water disinfection tablets plus hygienic storage vessel</td>
<td>randomized, placebo controlled, double-blind trial</td>
<td>Diarrhea rates n.s.</td>
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<td>Kirchhoff et al; 1985</td>
<td>Brazil</td>
<td>WSS/nutrition/health</td>
<td>In-house water chlorination program</td>
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<td>Feacal coliform level ++</td>
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<td>Austin; 1993</td>
<td>Gambia</td>
<td>WSS/nutrition/health</td>
<td>In-house water chlorination program</td>
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Hawthorne results

- Of the 11 studies that mentioned Hawthorne effects
  - 6 mentioned is as a possible bias in results
  - 5 argued the design of the experiment minimized the possibility of this bias
  - 1 used it as argument for matching design (rather than RCT)
  - 0 estimated the Hawthorne effect
- Sectors: nutrition; health insurance; education; agriculture; water and sanitation; microfinance
- A multi-experiments paper found that surveys and the fact of being observed may lead to biased impact estimates, depending on context (effect on reported diarrhea but not lending behavior) (*Zwane et al, 2010*)
Practices mentioned to minimize Hawthorne

- **Education (3 studies):**
  - Identical information and monitoring
  - Independent learning assessments

- **Health insurance (2 studies) and microfinance (2 studies):**
  - subject’s take-up decision is not observed by the surveyor,
  - nor do subjects know that their take-up is observed subsequently by researchers

- **Urban infrastructure/pavements (1 study):**
  - the municipality did not announce to the population the existence of this study
  - participants in the study (household respondents and the professional appraiser) were not aware of the ultimate objective of the survey
  - field workers trained not to mention the phrase “street pavement” to respondents
Some recommendations

• Measures to control for placebo effect
  – Double blind trials "control for" placebo (only 50% chance)

• Measures to identify placebo effect:
  – Include pure control as well in placebo controlled trials
  – Systematic reviews/ meta analysis including both placebo controlled and not

• Measures to minimize Hawthorne (additional to previous slide):
  – minimizing contact between the intervention and comparison groups
  – Double blind trials "control for" Hawthorne in the sense of making the effects equal for all groups
  – Observational method, BUT the absence of an independent variable does not allow any cause-effect conclusions to be drawn
Conclusions and next steps

- **Second phase of research:** Select a sector-stratified random sample of IEs and characterise the studies according to the likelihood of the existence of invisible treatment/ expectation effects, against the actual recognition of this by the authors.

- More studies needed with pure controls for the placebo-controls, to measure placebo effects.

- More qualitative research on psychological effects and patterns.

- How do psychological effects vary over population characteristics, as compared to the treatment effects?
Thanks! Gracias!

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