

Invisible treatments: placebo and Hawthorne effects in development programs

Marie Gaarder (3ie); Edoardo Masset (IDS);
Hugh Waddington; Howard White; Anjini Mishra, (3ie)

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 recognizing 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

	Database	Expert survey (additional)	Total
Placebo	6	2	8
Econometric placebo	7	1	8
Erroneous use (placebo)	2	0	2
Hawthorne	6	5	<i>11</i>
Other respondent effects	n.a.	3	<i>3</i>
Total	21	11	32

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*)

Placebo results cont.

Authors	Country	Sector	Intervention	Study design	Effect estimates
Drexler et al; 2010	Dominican Republic	Financial	Financial training for microentrepreneurs; classroom based versus home-visit add-on	RCT Control group received placebo follow-up visits	++ Placebo/ Hawthorne estimate: N/A
Stoltzfus et al; 2004	Zanzibar	Nutrition/ health	Iron supplementation and mebendazole for treatment of iron deficiency and helminth infections	randomized, placebo controlled, double-blind trial	Iron's effect on anemia limited; mebendazole ++ Placebo/ Hawthorne estimate: N/A
Kirwan et al; 2010	Nigeria	Nutrition/ health	Anthelmintic treatment for Plasmodium infection in preschool children	randomized, placebo controlled, double-blind trial	++ Placebo/ Hawthorne estimate: N/A
Simeon et al; 1995	Jamaica	Nutrition/ health/ education	Albendazole treatment of Trichuris trichiura Infections	randomized, placebo controlled, double-blind trial	School performance effect in children with heavy infections; weight gain effect in children with lighter infections Placebo/Hawthorne estimate: N/A
Maluccio et al; 2006	Guatemala	Nutrition/h ealth/ education	Early childhood nutrition intervention (food supplementation) for improving growth and cognitive development	RCT Control group received placebo drink (no energy content)	Cognitive effects/edu ++ Placebo/ Hawthorne estimate: N/A
Jain et al; 2008	Ghana	WSS/ nutrition/ health	In-house water disinfection tablets plus hygienic storage vessel	randomized, placebo controlled, double-blind trial	Diarrhea rates n.s. Placebo/ Hawthorne estimate: N/A
Kirchhoff et al; 1985	Brazil	WSS/ nutrition/ health	In-house water chlorination program	randomized, placebo controlled, double-blind trial	Feecal coliform level ++ Diarrhea rates n.s. Placebo/ Hawthorne estimate: N/A
Austin; 1993	Gambia	WSS/ nutrition/ health	In-house water chlorination program	randomized, placebo controlled, double-blind trial	Diarrhea rates n.s. Placebo/ Hawthorne estimate: N/A

Hawthorne results

- Of the 11 studies that mentioned Hawthorne effects
 - 6 mentioned it 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!
www.3ieimpact.org