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Extended Abstract**

**IMPACT OF PEERS AND INCENTIVES ON LYING ACROSS AGE AND GENDER: A
SCHOOL-BASED EXPERIMENT FROM INDIA**

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Abstract

We evaluate lying in school children across age groups with different gender compositions in the presence and absence of peers and incentives. We find (i) significant peer and incentive effects on younger children (ii) lesser lying tendencies in an all-girl's group at a younger age (iii) Effect of incentives independent of gender composition

Keywords: unethical behavior, lying, incentives, gender differences, peer effects, field experiments

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IMPACT OF PEERS AND INCENTIVES ON LYING ACROSS AGE AND GENDER: A SCHOOL-BASED EXPERIMENT FROM INDIA

[EXTENDED ABSTRACT]

Introduction

Lying though considered unacceptable, is not uncommon and in early stages of childhood is a sign of normative, cognitive and social development (Talwar and Crossman, 2011). Chronic lying however can be problematic and in children may be an indicator of delinquency and other maladjustment issues in adulthood (Stouthamer-Louber, 1986).

Studies show that age, gender, group vs individual dynamics, peers and incentives are some of the factors influencing lying (Jacobsen et al., 2018).

Researchers call for work to understand the development of lying and factors influencing it in children, to help identify problematic behavior and build an environment which nurtures honesty as they move into adulthood (Jacobsen et al. 2018, Talwar and Crossman, 2011).

To build on this area of work, we conduct our experiment in the highly relevant setting of a school and study effect of peers and incentives on lying across gender and age. We also attempt to understand whether the existence of lying behavior is normative or may have problematic implications.

Literature Review

Studies show that that deceptive behavior reduces with age, as cultural and social attitudes inform the value children attach to honesty, with an increase in age (Talwar and Crossman , 2011; Ding et al. 2014) . Gervais et al. (2000) conclude that persistent lying in children may be associated with disruptive behavior.

Research on gender differences finds that males lie more (Childs, 2012;). However, no gender differences are observed in the effect of incentives (Ezquerro et al. 2018).

Peer effects are also a strong influence on deceptive behavior (Carrell et al. 2008; Megehee and Spake, 2008). Cultural and social context have a significant effect on unethical behavior (Muehlheusser et al., 2014).

Methodology

The experimental design is inspired from Mazar et al.'s (2008) self-confidence maintenance experiments. Lies are broadly classified as anti-social (self-serving) and pro-social (altruistic) (Talwar and Crossman, 2011), our work studies the first.

The experiment was conducted between December 2018 - March 2019 across two states, Tamil Nadu and West Bengal. 629 students, aged 12-13 years (middle school) and 17-18 years (high school) participated in the study.

Students were randomly assigned to treatment and control groups. Schools with similar curriculum, locations and comparable fees (proxy for economic background of participants) were chosen to control for potential bias.

Each student completed a 4-minute questionnaire”

1. A 6x6 matrix with integers. Students had to find pairs of numbers that added up to ten
2. A simple maze had to be navigated. This question established the elementary nature of the questionnaire to prevent students feeling that it was “acceptable” if they were unable to solve the questions, to avoid a contagion effect.
3. Two pictures with *four* differences. This question screened for lying behavior as students were asked about the number of differences they had found.

Anonymity was maintained, papers were discarded and students were asked their answers.

Based on the this *students moving to round two could be identified* as lying.

The sample under study was divided randomly into the intervention or treatment group and the control group. Students underwent a peer versus individual treatment and an incentive versus no-incentive treatment with an unspecified prize.

Students who lied subsequently answered a qualitative questionnaire.

This was a blind experiment with no attrition bias. Random allotment of students to the control and treatment groups eliminated sampling bias. The questionnaire was tested to counter measurement bias. Response bias was taken care of, as the subjects did not have complete information regarding the study.

The two potential sources of bias are design and interviewer bias, and the self-reporting nature of the design is a limitation.

We use a logit model:

$$Y = \alpha + \sum_i^n \beta_i X_i + \epsilon$$

The conditional probability of a student lying, given the treatment is:

$$Pr(Y|X_1) = \frac{e^{\alpha + \beta_1 X_1}}{1 + e^{\alpha + \beta_1 X_1}}$$

Results

The experimental setup tests:

- a) Peer and individual settings (using a 2 x 2 factorial design)
- b) Incentives and no incentives

Each of these settings was applied to two age groups. We then evaluated the impact of gender, while controlling for peer effect in the younger age group. We test for incentive effect across a mixed and female group and discuss results (Table 1).

Result 1: Lying given the peer effect is significant at the younger age.

The probability of a student lying, conditional on the peer treatment is 0.4934 in middle school. Individually, the same probability drops down to 0.3684. Similar treatment for students of the older age group, has an insignificant (and negative!) impact on lying.

Controlling for peer effect, the treatment being age, middle-schoolers lie at high significance levels at 0.5026, which drops drastically to 0.2199 in high school.

When controlling for individual treatment, where students self-report results in an individual interview, we find no significant difference in lying across ages.

Result 2: Lying is lesser in a female setting as compared to a mixed gender group.

Controlling for peer effect, students are seen to significantly lie more when their cohort is mixed, as compared to a female setting. The probability of a student lying given a mixed group is 0.8529 which drops to 0.4499 when the group is female.

Result 3: The impact of incentives on lying is independent of gender composition

In a female setting, incentives do not have any impact on lying. This is unlike the highly significant role of the same when tested on mixed groups. However, given an experimental setup with incentives, lying tendencies of a female and mixed groups are not seen to significantly differ.

Conclusion and Discussion

We find greater effect of peers and incentives on the younger age. We find older participants prone to lying when *not* with their peers, i.e. a social setup works towards moderation at this age.

Studies suggest that anti-social lying does not continue to increase in development but peaks in adolescence and decreases in adulthood (Talwar and Crossman 2011, Ding, 2014) as adults learn to deal with their social environment without resorting to lying which can damage one's credibility. Our work supports this and despite the peer and incentive effects normative behavior prevails.

Our other results too are similar to earlier work; lying is lesser in a female group as compared to a mixed group indicating that the gender composition of the peer group has a significant impact on lying (Muehlheusser et al. 2014, Childs, 2012). We also find that the effect of incentives is independent of gender composition (Ezquerria et al., 2018)

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