

Pre-analysis plan for “Leadership Styles and Labor Market Conditions: An Experiment”

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1. Research questions

Our experiment aims to study the strategic use of leadership styles as a motivation tool. Subjects in our experiment are either in the role of managers or workers. Managers choose their “leadership style” in interacting with workers. The primary research question of this study is to check how managers adjust their leadership style contingent on the labor market conditions. Additionally, we will analyze the effect of leadership styles on workers’ behaviors, such as contract acceptance and effort choice.

2. Treatments

Overall, we vary three dimensions in this experiment: the choice set of leadership styles for the managers, market conditions concerning competitiveness, and the source of leadership behavior.

The choice set: Friendly and Unfriendly leadership styles

The first dimension we consider is the choice set of leadership styles from which the managers choose their leadership behaviors. The leadership style could be either ‘friendly’ or ‘unfriendly.’ We label a leadership style ‘friendly’ (unfriendly) if it positively (negatively) affects the well-being of a worker who is targeted by the leadership behavior. The leadership behavior induced in our experiment is in the form of messages that a manager can send to a worker regarding the worker’s performance. The leadership styles are implemented as different tones of the messages. For example, the friendly leadership style involves compliments and praises, while the unfriendly leadership style involves reprimands and scolding, contingent on workers’ performance. By varying the choice set for managers, which include neutral and friendly or/and unfriendly leadership styles, we study (1) managers’ adoption of friendly (unfriendly) leadership versus no leadership style and (2) their choice between friendly and unfriendly leadership style.

Labor market conditions: Excess Labor Demand/Supply

The second dimension we vary includes the labor market conditions: Excess Labor Demand (ELD) and Excess Labor Supply (ELS). In both treatments, one manager can hire a maximum of one worker. In the ELD treatments, the number of managers is higher than that of workers, making it unavoidable for some managers to stay without a worker. On the contrary, some workers remain unemployed under ELS, where there are more workers than managers.

The source of leadership behavior: Manager-message, Computer-message, No-message

We propose two main drivers of the managers’ choice of leadership styles: (1) the motivating effect of leadership styles and (2) the workers’ reciprocity in response to the perceived intention of managers. To disentangle the role of these two different mechanisms, we manipulate the source of the leadership style choices in the third dimension. First, in the ‘Manager-message’ treatment, managers actively choose their leadership style, that is, the tone of the messages they send to the workers. Second, in the ‘Computer-message’ treatment, computer randomization chooses the leadership style, and the managers are passive players who carry out the leadership style that is prescribed by the computer. Finally, we have control treatment where a computer chooses the tone

of messages with no motivational purpose; ‘No-message.’ The difference between the control treatment and the other two treatments is that the implementation of the chosen tone of messages is irrelevant to the workers’ performance in the control treatment, while it is performance-contingent under the “Manager-message” and “Computer-message” treatments.

Table 1 summarizes our treatments.

Table 1: The treatments

	The choice set of styles	Labor market conditions	The source of leadership behavior
Manager-message {U}	No leadership vs. Unfriendly leadership style	ELS or ELD (within-session, between-subject variation)	Manager
Computer-message {U}			Computer
No-message {U}			Control (no performance contingency)
Manager-message {F}	No leadership vs. Friendly leadership style		Manager
Computer-message {F}			Computer
No-message {F}			Control
Manager-message {U, F}	No leadership vs. Friendly leadership style, Unfriendly leadership style		Manager
Computer-message {U, F}			Computer
No-message {U, F}			Control

3. Data analysis plan

3.1 Definitions of variables

Our primary outcome variable is *the managers’ choice of leadership style*, which we denote by m_i , for a subject i in the role of a manager. We elicit the decision through the incentivized lab experiment following the design described in the main body of pre-registration.

Secondary outcome variables include the decisions made by workers. We elicit the workers’ decisions via the strategy method to obtain richer data, which allows us to observe workers’ reactions to different degrees of friendly/unfriendly leadership styles. Thus, the workers make decisions for all possible contract offers with different m .

- $accept_j$: worker j ’s binary acceptance decision contingent on the leadership style specified on the contract offer
- $effort_j$: worker j ’s effort choice contingent on the leadership style specified on the contract offer

We will test the effect of market conditions on our outcome variables by incorporating binary dummy variables in OLS regressions, which indicate a participant’s assignment to one treatment condition or not; $ELS_i=1$ if a subject i is assigned to the ELS treatment, $=0$ the ELD treatment.

We expect the mechanisms underlying the effect of market conditions on leadership style choice to depend heavily on the managers’ expectations about the motivational effect of the leadership style and the workers’ reciprocal reactions. Thus, we will elicit subjects’ beliefs on the effect of leadership styles on workers’ behaviors. We will incentivize correct beliefs and check whether the belief variables do indeed intermediate the hypothesized treatment effect.

- $belief_accept_i$: subject i ’s beliefs about the effect of unfriendly leadership styles on workers’ acceptance decisions

- *belief_effort_i*: subject *i*'s beliefs about the effect of unfriendly leadership styles on workers' effort choice

The choice of leadership styles and reactions to them might stem from individual characteristics, such as gender, age, risk attitude, views on social norms, personality, and prosociality. It is a priori unclear whether the market conditions will interfere with some of the individual idiosyncrasies (e.g., measures of prosociality and social norms). Thus, we will include the following covariates in our analysis and present a balance test for them to see whether some of the measures tend to be swayed by the market conditions even with the random assignment of the treatments.

- *socially_appropriate_i*: subject *i*'s incentivized estimation on modal response among other participants regarding the ratings on social appropriateness of the unfriendly leadership style following incentivized norm elicitation method of Krupka, Weber 2013
- *fair_i*: subject *i*'s incentivized estimation on modal response among other participants regarding the ratings on the fairness of the unfriendly leadership style following Krupka, Weber 2013
- *positive_reciprocity_i*: a non-incentivized GPS question where subject *i* self-reports their tendency to reciprocate positively on a scale from 0 to 10
- *negative_reciprocity_i*: a non-incentivized GPS question where subject *i* self-reports their tendency to reciprocate negatively on a scale from 0 to 10
- *trust_i*: a non-incentivized GPS question where subject *i* self-reports their tendency to trust in people's best intentions on a scale from 0 to 10
- *risk_taking_i*: a non-incentivized GPS question where subject *i* self-reports their general risk-taking propensity on a scale from 0 to 10.

We also ask about Big 5 personality measures (Rammstedt and John 2007), measures of Machiavellianism and Psychopathy (Jones, Paulhus 2013), gender, age, education, and work experience in the exit questionnaire.

3.2 Model specifications

We use the following model to test the effect of market conditions on managers' strategic use of leadership styles:

$$m = X\beta + \delta \cdot ELS + session\ FE + \varepsilon,$$

where the matrix X contains the covariates mentioned above, and ε stands for the error term. By running the OLS regressions with different specifications of X to include different subsets of covariates, we will check the stability of the estimation of the treatment effect, $\hat{\delta}$. We are especially interested in the mediating role of the managers' expectations on the workers' behaviors; *belief_accept* and *belief_effort*.

The secondary analysis involves the effect of leadership styles on the workers' behavior and whether this effect changes across the treatments: baseline, Computer-message, and Leader-message treatments with ELD and ELS conditions.

$$\begin{aligned} accept &= \alpha_0 + \alpha_1 \cdot m + individual\ FE + \varepsilon, \\ effort &= \gamma_0 + \gamma_1 \cdot m + individual\ FE + \varepsilon. \end{aligned}$$

Comparing estimates of α_1 and γ_1 in separate regressions under different treatment sets will help us isolate the effect of leadership actions on the worker behavior and hence, the different drivers of leadership style choices. Since the workers' decisions are elicited through the strategy method, we can collect the individual reaction functions of all workers. However, to draw inferences on the general tendency of workers' reactions across different treatments, we account for the individual predisposition by including the fixed effect at the subject level.

In addition to the main tests, we also run exploratory tests where we check the treatment effects on the variables such as subjects' beliefs, social norms, and prosociality measures to further shed light on the mechanisms that operate behind the strategic use of leadership styles.

With the results of the exploratory analysis as our guidelines, we will run separate OLS regressions with the models for our main tests. In case we find a failure of the balance test on some variables, for example, the measures of social norms, we can split the sample by the measures (e.g., normative view on social appropriateness; low vs. high) and see whether the size and significance of the effect of market conditions differ for different subgroups.

We will also conduct subgroup analysis based on gender and other personality measures to see the heterogeneity of the treatment effect.

4. Procedural details of the experiment

We plan to run sets of 16 sessions to have 32 groups per treatment in the laboratory located at Technische Universität Berlin. The sample size is based on power analysis with an effect size of 0.5 (Power 0.8, alpha 0.5) for the mean difference regarding the leadership style choices across two main treatment groups with different labor market conditions. The subjects will be recruited by the lab from the Wissenschaftszentrum Berlin für Sozialforschung (WZB) subject pool via ORSEE.

6. Previous data collection for this study

Pilot sessions

We collected the reference data to incentivize belief elicitation and measures of social norms (Krupka, Weber 2013) from five pilot sessions on the 4th and 5th of October 2022 in the above-mentioned lab at Technische Universität Berlin, involving the same subject pool.