Supporting documents for “Decision-Making in Virtual Team Leadership: The Impact of Timing on Reward Distribution – An Online RCT Study’’

Keisuke Hattori*, Aoyama Gakuin University
Keisaku Higashida, Kwansei Gakuin University
Kimiyuki Morita, Senshu University

Abstract/Summary:

This study employs a randomized controlled trial (RCT) with scenario experiments to delve into the allocation of rewards by virtual team leaders. It investigates how leaders make decisions regarding the distribution of rewards among themselves and their team members, under different scenarios that revolve around when leaders decide on reward allocation and the information available to them.

In this experimental setup, participants are asked to imagine themselves as team leaders with the authority to determine how rewards are allocated within the team. The key question revolves around what percentage of the total team earnings leaders choose to allocate to themselves and what reasoning underlies their choices.

Furthermore, this research aims to shed light on how real-world leaders behave differently from the often observed "rational" dictators in simple games. It explores the expressions of traits like generosity and responsibility in leaders' decisions and seeks to identify the individual characteristics associated with such behaviors.

To accomplish this, an online survey methodology is employed, and the study also examines whether personality traits and gender play a role in influencing these allocation decisions.

Study Design:

Participants will be randomly assigned to one of four groups, each facing different scenarios for deciding how to distribute rewards within their teams:

1. Pre-Project Decision group: Leaders determine the percentage of earnings they and their team members receive before the project starts.
2. Post-Project Uncertainty group: Leaders make allocation decisions after the project concludes but before knowing the earnings.
3. Positive Outcome group: Leaders make decisions after being informed of high earnings.

*School of Business, Aoyama Gakuin University; hattori@busi.aoyama.ac.jp.

4. Negative Outcome group: Leaders make decisions after being informed of low earnings.

Participants will provide responses based on their imagined decisions as team leaders, determining what percentage of the total team earnings goes to themselves and team members. Additionally, participants will provide the reasoning behind their choices. Personal Traits of participants will also be collected as control variables or interaction terms. For detailed questionnaires and scenario descriptions, please refer to the Appendix.

Hypotheses:

In this study, we will test the following two hypotheses:

H1 (Leaders Show Generosity): Leaders who can decide on the reward distribution before the project starts are hypothesized to allocate a smaller percentage of rewards to themselves, hence a larger share to their team members, compared to those making the decision post-project completion.

H2 (Leaders Show Responsibility): Leaders informed of poor project outcomes are hypothesized to allocate a smaller percentage of rewards to themselves, thus a larger share to their team members, relative to those informed of better outcomes.

Data Analysis Plan:

The Pre-Project Decision and Post-Project Uncertainty groups' responses will be compared using a t-test to assess the extent of leaders' generosity intended to encourage team effort. Likewise, a t-test will compare the Positive Outcome and Negative Outcome groups to examine how leaders' reward allocations reflect their sense of responsibility. Personality traits, career orientation, risk aversion, altruism, and competitiveness, as well as gender, will be considered as control variables, and their interaction effects will be analyzed using regression analysis and multi-factor ANOVA.

In detail, for the analysis of our hypotheses, we will employ two stages of regression models to comprehensively evaluate the impact of interventions under different scenarios.

Initially, our regression models for Hypothesis 1 and 2 will be formulated as follows:

1. For Hypothesis 1:

$$Y_i = \beta_0 + \beta_1 * InvterventionDummy_i + \sum(\beta_{2k} * ControlVariable_{ik}) + \epsilon_i$$

In this model, $InterventionDummy_i$ represents '0' for the Pre-Project Decision Group and '1' for the Post-Project Uncertainty Group.

2. For Hypothesis 2, the model is similar to Hypothesis 1, with the intervention dummy

representing '0' for the Positive Outcome Group and '1' for the Negative Outcome Group. In these initial models, Y_i represents the percentage of rewards each participant, acting as a virtual team leader, allocates to themselves. The $InterventionDummy$ varies depending on the hypothesis being tested, and individual characteristics such as age, gender, personality traits, risk aversion, and altruism are included as $ControlVariable_{ik}$.

To further explore the dynamics of our hypotheses, we will extend these models to include interaction terms between the intervention dummy and individual characteristics. This enhanced approach allows us to examine how the effects of the intervention may vary depending on individual profiles.

The extended models for both hypotheses will include terms for:

$$Y_i = \beta_0 + \beta_1 * InterventionDummy_i + \Sigma (\beta_{2k} * ControlVariable_{ik}) + \Sigma (\beta_{3k} * InterventionDummy_i * ControlVariable_{ik}) + \varepsilon_i$$

with $InterventionDummy_i * ControlVariable_{ik}$ representing the interaction terms.

By adopting this two-staged modeling approach, we aim to capture not only the direct effects of the interventions on the leaders' decision-making but also to understand how these effects may be moderated or amplified by the participants' individual characteristics.

Furthermore, in our regression analyses to validate the effects of interventions, variables will be excluded from the model when the correlation among control variables exceeds 0.85, or the Variance Inflation Factor (VIF) exceeds 10. However, variables critical to the objectives of this study, such as career orientation, altruism, fairness, and competitiveness, will be preferentially retained. The analysis will incorporate models that assess the pure effects of the intervention without control variables, models that include all control variables, and models that select control variables based on the aforementioned criteria. This approach is aimed at ensuring the robustness of the results and an accurate assessment of the intervention's effects.

Study Duration and Participant Recruitment:

The experiment will be conducted using an online survey company in Japan, with the anticipated timeframe for data collection being one week between 2023/12/7 to 2023/12/11 (estimated). The study participants will consist of registered Japanese users of the online survey company, and the sample size will be collected until it reaches 520 valid participants. The target population will be limited to individuals aged 20 to 59 who are employed. Gender balance will be ensured within each intervention group.

Incentives for Experimental Participants:

Participants will answer 8 major questions, comprising a total of 24 to 25 sub-questions (which may vary slightly by group), and will receive a monetary reward ranging from 8 to 10

Japanese yen (approximately 5 to 7 U.S. cents) for their participation. The estimated time required to complete the experiment is approximately 3 to 5 minutes.

Rationale for Sample Size Design:

We calculated the required sample size for our study, considering a medium effect size (Cohen's f = 0.25), an alpha error of 0.05, and a power of 0.8 for a three-way ANOVA analysis. The calculations indicated that approximately 119 participants were needed for each scenario. To accommodate two separate experiments, we decided to obtain a total of 520 participants, with each experiment comprising four groups, each consisting of 130 participants.

Implications:

The research will shed light on the distributive decisions of leaders in team settings, especially in contrast to the rational behaviors observed in 'Dictator Game' scenarios. It aims to explain why real-world leaders might exhibit behaviors motivated by generosity and responsibility. Additionally, the study will explore how career orientation and personality traits impact leadership decisions, potentially providing guidelines for leadership selection in corporate organizations.

Research Ethics:

The study has been approved by the Research Ethics Committee of Aoyama Gakuin University and will adhere to the university's ethical guidelines to ensure participants' anonymity.

Appendix: Questionnaire Details

A.1 English translation of scenarios sued in the experiment

Scenario-Based Questionnaire

Please read the following scenario (a hypothetical situation) carefully and answer the subsequent questions.

Common Scenario for All Intervention Groups

You are the leader of a three-member team, including yourself, at your job and you are about to embark on a new team project. As the leader, not only are you advancing the project, but you are also entrusted with the most responsible roles, such as the overall management of the team's work, member motivation management, and decision-making for the distribution of rewards. If everyone in the team puts in more effort, the project can generate larger profits. With maximum effort from everyone, the project could yield a profit of up to 6 million yen (approximately 40,000 dollars), but with inadequate effort, it might only produce a minimum of 600,000 yen (approximately 4,000 dollars).

Group-Specific Scenarios

For Pre-Project Decision Group:

*Now, **at the meeting before the start of this project**, you are about to declare in front of the two members how the profits expected from this project will be divided as rewards between yourself and the two members.*

For Post-Project Uncertainty Group:

*Now, **the project period has ended**, and all that is left is to wait and see how much profit the project will generate. At the meeting, you are about to declare in front of the two members how the profits expected from this project will be divided as rewards between yourself and the two members.*

For Positive Outcome Group:

*Now, **the project has ended with the best possible outcome**, generating a profit of 6 million yen. At the final meeting, you are about to declare in front of the two members how the profits earned from this project will be divided as rewards between yourself and the two members.*

For Negative Outcome Group:

*Now, **unfortunately, the project has ended with the worst possible outcome**, generating a profit of only 600,000 yen. At the final meeting, you are about to declare in front of the two members how the profits earned from this project will be divided as rewards between yourself and the two members.*

Common Scenario for All Intervention Groups

You have the freedom to decide your own share of the reward, with the stipulation that the shares of the other two members are equal (for example, you might take 50% of the reward while the other two members each take 25%). The other members have no choice but to follow this decision, and you cannot overturn this decision later. This team will disband once the project is completed, and there will be no further opportunities to work with these members.

Main Question:

As the leader of this team, what do you think you would decide for your own reward, as well as the rewards for the members, and how would you announce this in front of the members at this meeting? Please specify the percentage of the total rewards that you would take for yourself, between 0 to 100.

A.2 Other inquiry items in the experiment

Personal Attributes and Attitudes (for control):

1. Gender
2. Age
3. Employment Status
4. Altruism
5. Optimism
6. Risk Preference
7. Trust
8. Career Orientation
9. Job Satisfaction
10. Industriousness/Conscientiousness
11. Competitiveness
12. Sincerity
13. Fairness
14. Modesty

15. Greed-Avoidance

In the survey, for items 4, 6, and 7, we partially use the question wording from Falk et al. (2023). For item 10, which measures Industriousness/Conscientiousness as part of the Big Five personality traits, we adopt the questions proposed by Oshio et al. (2012). For item 11, we employ the question formulation suggested by Fallucchi et al. (2020). Items 12 through 15 are based on the questions from the HEXACO model of personality structure by Ashton & Lee (2007).

Other Survey Items:

1. Distribution Justification: Inquiry into the rationale for the chosen allocation of rewards.
2. Project Outcome Projections: Questions on the expectations (for Pre-Project Decision and Post-Project Uncertainty groups) and factors (for Positive and Negative Outcome groups) influencing the project's success or failure.
3. Instructional manipulation check

References

Ashton, M. C., & Lee, K. (2007). Empirical, theoretical, and practical advantages of the HEXACO model of personality structure. Personality and social psychology review, 11(2), 150-166.

Falk, A., Becker, A., Dohmen, T., Huffman, D., & Sunde, U. (2023). The preference survey module: A validated instrument for measuring risk, time, and social preferences. Management Science, 69(4), 1935-1950.

Fallucchi, F., Nosenzo, D., & Reuben, E. (2020). Measuring preferences for competition with experimentally-validated survey questions. Journal of Economic Behavior & Organization, 178, 402-423.

Oshio, A., Abe, S., & Cutrone, P. (2012). Development, Reliability, and Validity of the Japanese Version of Ten Item Personality Inventory (TIPI-J), The Japanese Journal of Personality, 21, 40-52. (in Japanese)