With risk comes reward (April 24th, 2023)

1. Setting and design

Two group members choose between actions blue (safe project choice) or orange (risky project choice). The earnings are given by the following table, where the first entry in each cell indicates group member 1's payoff, and the second entry indicates group member 2's payoff.

	Group member 2 chooses blue	Group member 2 chooses orange
Group member 1 chooses blue	SafePayoff (\$4), SafePayoff (\$4)	SafePayoff (\$4), LowPayoff (\$2.75)
Group member 1 chooses orange	LowPayoff (\$2.75), SafePayoff (\$4)	HighPayoff (\$4.75), HighPayoff (\$4.75)

This is a standard stag-hunt coordination game, henceforth called Treatment 1. Both players are better off if both choose orange, but choosing orange is risky when there is strategic uncertainty. The risk-dominant equilibrium is (blue, blue).

Hypothesis 1: In Treatment 1, group members will choose blue most often (>50%), such that the efficient outcome rarely occurs (<25%).

Suppose now that a first-mover/leader chooses between blue and orange before the other two group members. The other group members can observe the leader's choice. The setting becomes a sequential stag-hunt game with three players, one moving first. As before, choosing orange gives the highest payoff if everyone chooses orange. However, choosing orange gives a low payoff if any of the other two players choose blue. Blue gives a safe payoff irrespective of others' choices.

We consider 5 treatments with a first-mover. In all treatments, the safe payoff is \$4 for everyone. In all treatments, the two other group members have a LowPayoff of \$2.75 and a HighPayoff of \$4.75.

- In T2 (Baseline), the first-mover has the same LowPayoff and HighPayoff as the group members.
- In T3 (Ineq. & No Risk), the first-mover has a HighPayoff of \$10 and faces no risk because of a LowPayoff of \$4, equal to the SafePayoff.
- In T4 (Ineq. & Same Risk), the first-mover has a HighPayoff of \$10 and faces the same risk as the group members, i.e., a LowPayoff of \$2.75.
- In T5 (Ineq. & Large Risk), the first-mover has a HighPayoff of \$10 and faces a large risk because of a LowPayoff of \$0.

- In T6 (Ineq & Large Risk & Endo), the parameters are the same as in T5, and each of the three players in a group can choose whether they prefer to be the first-mover or a group member.

2. Model and hypotheses

The first-mover can potentially coordinate others' actions on choosing orange. We hypothesize that the first-mover's ability to do so depends on the first-mover's incentives.

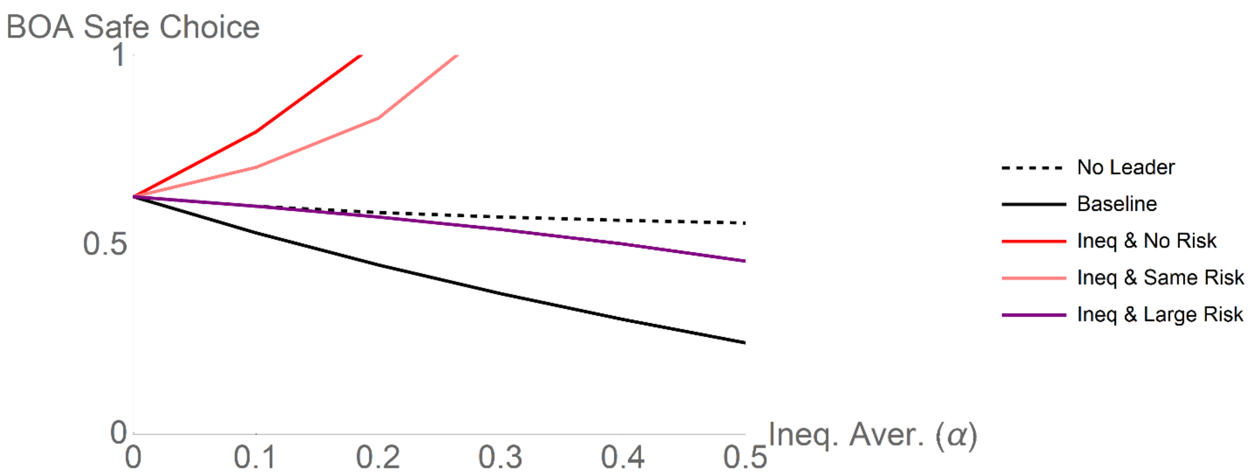
To guide intuition, we use a simple model of inequality aversion. Preferences for efficiency and preferences over beliefs (psychological game theory) should also be considered when building a fully-fledged model. However, to examine whether inequality can undermine leadership and how risk can alleviate such effects, a parsimonious model based on inequality aversion and risk dominance is sufficient. Let a group member's utility function be

$$u(x, y, z) = x - \alpha * |x - y| - \alpha * |x - z|$$

where x is a group member's own payoff, y is the other group member's payoff, and z is the first-mover's payoff. The parameter α measures inequality aversion.

The following figure displays the basin of attraction of the safe choice (blue) depending on α. Following the equilibrium selection of risk dominance, we predict that people will be more likely to choose orange if the basin of attraction of blue is small.

Figure 1: Theoretical Predictions



Note: We double α for the No Leader treatment to account for the group size.

We summarize the predictions in the following hypotheses.

Hypothesis 2: The presence of a first-mover in the Baseline (Treatment 2) will increase the frequency of orange choices compared with the No Leader treatment (Treatment 1). Specifically, conditional on the leader choosing orange, the frequency of orange choices by the group members will increase compared to when there is no leader.

Hypothesis 3: The Ineq & No Risk treatment (Treatment 3) will reduce the first-mover's effectiveness compared to the Baseline treatment (Treatment 2). Conditional on the leader choosing orange, the frequency of orange choices by the group members will decrease.

Hypothesis 4: Increasing the risk of the first-mover (Treatments 4 and 5) will increase first-mover effectiveness compared to the Ineq & No Risk treatment (Treatment 3). Conditional on the leader choosing orange, the frequency of orange choices by the group members will increase as the leader's risk exposure grows.

To summarize, we hypothesize that inequality undermines leader effectiveness, but the risk can justify inequality.

We further hypothesize that leaders anticipate these effects. This would imply that leaders will be willing to choose orange (the risky choice) even when they face significant downside risk. So, the above hypotheses also hold *overall*, i.e., for the unconditional means.

Hypothesis 5: Hypotheses 2 to 4 also hold for the overall frequencies of orange choices, i.e., when including cases where the leader chooses blue. That is, the overall probability of choosing orange will increase in Treatment 2 compared to Treatment 1, will decrease in Treatment 3 compared to Treatment 2, and it will be higher in Treatments 4 and 5 than in Treatment 3.

Hypothesis 5 would imply that *adding* risk to an environment *increases* a group's overall success through social preferences and followers' perception of the leader.

Finally, as Treatment 6, which we call Ineq & Large Risk (Endo), we consider the case of endogenous leadership. Here, we let each of the three group members choose if they want to be a first-mover or not. We use the Treatment 5 parameters for this because there the trade-off between the two roles is clearest. The predictions are the same as for Treatment 5. We aim to see which type of person is willing to lead their group.

3. Comparisons across countries

We will conduct the study online using Prolific to recruit a US sample and one from the Nordic Countries (Denmark, Finland, Iceland, Norway, and Sweden). Based on prior literature, we anticipate that leader-follower inequality is more likely to undermine coordination in the Nordic Countries than in the US.

Hypothesis 6: The difference between the frequency of orange choices in the Baseline (Treatment 2) and the frequency of orange choices in each of the treatments with inequality (Treatment 3 , 4, and 5) is larger in the Nordic countries sample than in the US.

4. Elicited measures

We elicit subjects' risk aversion, inequality aversion, expectations about inequality aversion, and nonconformity preferences. We predict that greater risk aversion, greater inequality aversion, and especially expectations about it, lead to more blue (safe) choices. We also predict that risk aversion and conformity correlate negatively with selecting the leader role in Treatment 6.

Addition September 22, 2023 (after collecting the above data but before running this new treatment):

We plan to add a new treatment where the leader has no bonus and no risk. So:

In T7 (NoIneq. & NoRisk), the first-mover has a HighPayoff of $4.75 and faces no risk because of a LowPayoff of $4, equal to the SafePayoff.

Hypothesis 6: Reducing the risk of the leader will lower first-mover effectiveness even if there is no bonus.