



Does a leader's self-assessed integrity matter?

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ABSTRACT

We investigate the impact of leaders' integrity on group behavior in a single-shot collective action game. Leaders have exclusive knowledge of their group projects and lead via cheap-talk investment suggestions. Followers observe the suggestion but not their leader's actual decision. Leaders can sometimes benefit from deceiving their followers (suggesting invest without actually investing themselves). In our Baseline condition, followers only observe their leaders' suggestions. We have three treatments: Integrity, followers additionally observe leaders' self-assessed integrity category; Random, followers additionally observe a randomly chosen group member's integrity category; Driving, followers additionally observe leaders' self-assessed driving skill category. On average, the likelihood that leaders follow their own investment suggestions in the treatments does not differ significantly from the Baseline. Likewise, on average, the frequency at which followers invest, having observed an invest suggestion, does not differ significantly in the treatments from the Baseline. When an integrity categorization is revealed, the category revelation influences followers' investment decisions. Followers receiving invest suggestions from leaders categorized as average/low integrity invest at approximately half the rate as followers receiving invest suggestions from leaders categorized as high integrity. Revealing that a random member is categorized as average/low integrity, however, does not negatively affect followers' investment rate.

1. Introduction

Free riding and coordination failures are common problems in group settings (Albanese & van Fleet, 1985). Indeed, it has been proposed that the function of leadership in society has emerged precisely in response to problems such as a lack of coordination (of effort, resources, production, etc.) among group members (Van Vugt et al., 2008). Economists have demonstrated that leaders can help collectives overcome group-dynamic obstacles to efficiency, coordination, and cooperation with either their words or their observable actions [i.e., cheap talk or actual commitment, respectively; see Sahin et al. (2015)] for an extensive review).

We contribute to the multidisciplinary leadership and decision-making literatures by pushing the limits of leadership through cheap talk via having suggestions come from leaders categorized as possessing varying levels of *self-assessed* integrity.¹ The question here is whether this self-assessed integrity affects the cheap talk signal or not. Specifically, we test if cheap-talk suggestions coming from leaders of higher purported integrity elicit greater coordination and cooperation.

We administer a leader-follower game in which the leader chooses an action (invest or not) and a cheap-talk signal (all invest or no one invest) or no signal for two projects (one project that features possible coordination failures and one that represents the free-riding problem). Then one of the two projects is randomly selected for the group. Followers know one of the projects will be randomly assigned to their group but are unaware which project is actually selected for them. In the project representing the free-rider problem, if leaders send invest signals and at least one of their two followers acts accordingly, the leaders can privately benefit by not following their own suggestions. The followers independently and simultaneously decide whether or not to invest in the uncertain project knowing their leaders' suggestions but not their leaders' actual actions. The *efficient* outcome, but not always the *theoretically predicted* outcome (the equilibrium outcome) of the game, is full cooperation in both projects.

There are four experimental conditions: 1) followers know the leader's suggestion but receive no additional information (Baseline); 2) followers know the leader's suggestion as well as their leader's self-

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¹ Based on responses to an adapted 15-statement assessment (Becker and Ulstad, 2007).

Table 1
Net Payoffs to Subject i.

Project 1 (Coordination Problem)	Subject i's action		Project 2 (Free-Riding Problem)	Subject i's action	
	Invest	Not invest		Invest	Not invest
Both subjects j and k invest	20	17	Both subjects j and k invest	13	15
Only j or k invest	13	14	Only j or k invest	9	12
Neither j nor k invest	7	10	Neither j nor k invest	5	10

assessed integrity category (the Integrity Treatment); 3) followers know the leader's suggestion and the integrity category of a randomly chosen group member (The Random Treatment); and 4) followers know the leader's suggestion and their leader's automobile driving skill category (the Driving Treatment).² In all treatments, followers make their decisions knowing their leader's suggestion but not their leader's actual decisions. Our design enables us to determine: 1) if information regarding leaders' integrity influences followers' decisions whether or not to invest; 2) the impact of the *relevance* of the communicated information; and 3) whether equivalent information about a *random group member* has a comparable effect. The results have implications both for the role of a leader in general as well as for the role that a leader's integrity plays in directing a group toward an outcome beneficial for the group.

Our results suggest that on average, and regardless of the problem, the leaders' commitment to their investment suggestions does not differ significantly across categories within and across the Baseline and the three treatments, with one exception. For the Integrity Treatment's coordination problem, leaders categorized as high integrity are marginally more likely to commit to their investment suggestions compared to leaders categorized as average/low integrity.³

Nevertheless, perceptions about leaders' integrity (and to a lesser degree that of random team members) matter. In the two treatments in which an integrity categorization is revealed, followers invest at a significantly higher rate than they do in the Driving treatment, within the high integrity category, and the Baseline overall. In the Integrity Treatment, followers receiving invest suggestions from leaders categorized as average/low integrity invest at approximately half the rate as followers receiving the same suggestions from leaders categorized as high integrity. The revelation that a random member is categorized as average/low integrity does not negatively affect followers' investment rate. When a leader is identified to be of average/low integrity, a diversion from leaders' integrity category to a less relevant trait represented by the Driving Treatment seems to increase followers' cooperation.⁴

2. Literature review

The Psychology, Management, and Economics literatures collectively agree on a leader's potential to help groups overcome obstacles to coordination and efficiency. However, these disciplines deviate in their standard conceptualization of what constitutes a leader as well as on the necessary and sufficient conditions for leadership. The Psychology/

Management literatures pay great attention to common and unique characteristics associated with being a leader (see, for example, Bass, 1990). One such characteristic that informs the individual difference contributor in the current investigation is encompassed under the umbrella of *ethical leadership* (i.e., the modeling and promotion of morally appropriate behavior; Brown & Treviño, 2006).⁵

Ethical leaders are viewed as being trustworthy, considerate, and honest (Brown et al., 2005; Toor & Ofori, 2009).⁶ Ethical leadership has been associated with several positive business outcomes, including prosocial workgroup behaviors (and decreased incidences of deviance; Mayer et al., 2009), increased levels of organizational attractiveness (e.g., to potential applicants; Strobel et al., 2010), greater follower motivation (Brown et al., 2005), and subordinate performance boosts (Walumbwa et al., 2011). Kosfeld and Rustagi (2015) report that leaders with punishment powers who use these powers *ethically*, to encourage efficiency and equality, foster better group outcomes than those who punish indiscriminately. A recent meta-analysis (Ng & Feldman, 2015) supports many of the previously noted positive associations for both subordinate attitudes (e.g., job satisfaction and organizational commitment) as well as behaviors (e.g., task performance and voluntary acts of citizenship).^{7,8}

In contrast to the Psychology/Management approach, Economic studies of leadership do not typically focus on the role of the leaders' personal, demographic, and/or socioeconomic characteristics (e.g., the individual difference lens is not commonly applied).⁹

⁵ This concept of ethical leadership garnered focused interest following several high-profile scandals in American industry in the early 2000s (see, for example, Carson's 2003 review of ethical lapses and subsequent failures at Enron and Worldcom). The focus here was placed on the unique characteristics or behaviors of leaders that may have contributed to (or impeded) failure. Prior to these scandals, an ethical dimension of leadership was most commonly embedded within the broader framework of transformational leadership (Bass and Steidlmeier, 1999). Ethical leadership however became a unique focus of interest when it was noted that the transformational concept of charisma would benefit from a distinction between similarly charismatic leaders of different moral characters (for example, Adolf Hitler and Mahatma Gandhi).

⁶ Riggio et al. (2010) propose a virtues-based conceptualization of ethical leadership, drawing upon philosophers such as Aristotle and St. Thomas Aquinas to develop a characterization of an ethical leader as someone who exhibits prudence, courage, emotional control, and justice.

⁷ It is believed that the effectiveness of these leaders is due in part to reciprocity (Mayer et al., 2009): Subordinates, customers, and peers who are treated ethically by persons in leadership positions will tend to also engage in such behaviors, leading in time to generally positive outcomes (such as attitudes toward work, Mayer et al., 2010; or actual performance, Piccolo et al., 2010). Ng and Feldman (2015) confirmed many beneficial effects of ethical leadership, but they also directly tested a mediational mechanism, documenting some support for the notion that subordinates exhibit more positive attitudes and engage in more productive behaviors because they trust ethical leaders. Along a similar line, there are numerous Economic studies of reciprocity (Milinski et al., 2001; Wedekind and Braithwaite, 2002; Falk and Fischbacher, 2006; and Charness et al., 2011). These studies find that prior actions are interpreted as a signal of the type of person with whom a player is matched.

⁸ Eisenbeiss and Van Knippenberg (2015) note that, although typically considered a "good thing," ethical leadership may not be effective for all employees (for example, ethical leaders appear to be more effective with *mindful* followers).

⁹ Exceptions include Rotemberg and Saloner (1993), who compare the effectiveness of selfish and empathetic managers in different situations, Kulas et al. (2013), who investigate the effect of leaders' risk attitudes, Grossman et al. (2015), who investigate gender differences in leadership, and Grossman et al. (2019), who investigate how perceptions of leaders differ by gender. Of particular relevance to the current project, d'Adda et al. (2017) examine the influence of unethical leaders on followers' behavior. They report that self-interested and dishonest group leaders influence the ethical conduct of their followers such that these followers themselves exhibit high levels of dishonesty.

² Based on an adapted 14-statement survey (Clapp et al., 2011) similar in length and form to our integrity assessment.

³ Regardless of the treatment, leaders are more likely to invest after suggesting their followers invest for the Coordination problem than for the Free-Riding problem.

⁴ On average, followers' willingness to invest when observing an invest suggestion from their leaders does not differ across our Baseline and three treatments. In the Random Treatment, however, followers' likelihood of investing when observing an invest suggestion from their leaders is statistically larger than it that in the Baseline.

Economics has typically categorized leadership along one or more of four dimensions (Sahin et al., 2015). One dimension is the information regime. Some leaders have exclusive access to critical information;¹⁰ others are simply first movers with no information advantage.¹¹ A second dimension is the means by which a leader is selected. In many studies, the leader is a randomly selected player; in others, the leader is chosen by a “...transparent procedure”, by volunteering, or by election.¹² The third dimension is the leader’s set of actions. In some studies, the leader leads by making a costly commitment;¹³ in others, the leader leads simply via cheap talk.¹⁴ The final dimension is the type of collective action at hand. Sometimes the collective action is a linear public good game in which free riding is a dominant strategy, while within other investigations leadership is addressed in coordination.¹⁵ There are also games that simultaneously capture both the free-riding problem and coordination failures.¹⁶

For our approach, we borrow the ethical leader individual difference construct of *integrity* from the Psychology domain and embed it within the strong methodological framework of Behavioral Economics. In our design, leaders are randomly selected, have exclusive access to information, lead via a cheap-talk signal, and operate within a collective action that simultaneously captures both the free-riding problem and coordination issues. Furthermore, members of the group are (within the Integrity Treatment) provided a self-assessed indicator of their leader’s ethical character via information regarding the leader’s integrity category. We contribute to the leadership literature by investigating how perceptions of the leaders’ character might affect group behavior when the leaders may *privately benefit* from deceiving their followers. Operationally, we investigate whether information regarding the leaders’ integrity reveal affects the efficacy of leadership (i.e., followers’ engagement in a collective action).

3. Game design

Our one-shot game is a modification of the Komai et al. (2011) three-person investment game. Players are endowed with \$10 and decide whether or not to invest it in their group’s randomly assigned project. The group faces two equally probable projects: Project 1 with potentially high returns (hereafter, the Coordination problem) and Project 2 with potentially average returns (hereafter, the Free-Riding problem) (see Table 1). For both projects, full cooperation (investment) is the efficient outcome for the group. For the Coordination problem, a player would choose to cooperate only if the player thinks others will do the same. For the Free-Riding problem, the dominant strategy of any player is not to cooperate regardless of the strategies chosen by other group members.

The game has a sequential (leader-follower) structure. The leader

¹⁰ See, for example, Hermalin (1998), Vesterlund (2003), Potters et al. (2005, 2007), Komai et al. (2007), Komai and Stegeman (2010).

¹¹ See, for example, Moxnes and van der Heijden (2003), Bardsley and Sausgruber (2005), Guth et al. (2007), Levy et al. (2011), Gächter et al. (2012), Jack and Recalde (2015), Sahin et al. (2015). Kaplan et al. (2018) have a two-player game with no leader but where players either move simultaneously, in a predetermined sequence, or can wait to see which player moves first. Payoffs are highest when players move sequentially.

¹² Transparent procedure: Eckel et al. (2010); volunteering: Arbak and Villevial (2013); Rivas and Sutter (2011); election: Brandts et al. (2014); Grossman and Baldassarri (2012); Jack and Recalde (2015).

¹³ See, for example, Hermalin (1998), Vesterlund (2003), Moxnes and van der Heijden (2003), Bardsley and Sausgruber (2005), Potters et al. (2005, 2007), Guth et al. (2007), Komai et al. (2007), Komai and Grossman (2009), Komai and Stegeman (2010), Levy et al. (2011), Gächter et al. (2012), Jack and Recalde (2015).

¹⁴ See, for example, Wilson and Sell (1997), Levy et al. (2011), Houser et al. (2014).

¹⁵ Linear public good game: Guth et al. (2007); coordination games: Brandts et al. (2007).

¹⁶ See, for example, Komai and Stegeman (2010), Komai et al. (2011), Kulas et al. (2013), Grossman et al. (2015).

chooses an action (invest or not) and a cheap-talk signal (all invest, no one invest) or no signal for both projects. We emphasize to the players that both projects are equally likely to happen and thus they should make their best decisions. It is not required that suggestions reflect leaders’ actual investment choices and all players know this. Groups are then randomly assigned one of the two projects, and the leaders’ suggestions (but not their actual investment decisions) for the assigned projects are passed to their followers, who then simultaneously and independently make their investment decisions.

The game has two pure Bayesian Nash equilibria. One is a trivial equilibrium in which no one ever invests. The alternative is a more efficient equilibrium in which the leader invests in the Coordination problem but not in the Free-Riding problem, and followers decide to invest. The most efficient outcome is the one in which all three players invest in both problems. Neither the leader’s costless suggestion nor the leader’s integrity reveal alters the payoff structure of the game and the equilibrium analysis. An investment suggestion for a leader categorized to be of high integrity, however, may affect the equilibrium selection, leading the group to the more efficient outcome (Farrell & Rabin, 1996).

Note that, regardless of their investment action and regardless of the problem, leaders do not benefit from their followers’ refusal to invest, and thus given the costless nature of an investment suggestion, payoff-motivated leaders have no reason to suggest a noninvest decision. Followers can hardly find a noninvestment suggestion encouraging.

We did not find it suitable to address leader’s integrity (i.e., acting in a manner consistent with the suggestion sent) by simply designing a coordination game such as our coordination problem. In the coordination context, the leader does not have a strong incentive to suggest “investment” as a course of action to the followers, while doing the opposite. Such an incentive for the leader, however, strongly exists in the free-riding problem and thus the free-riding problem is suitable to address a leader’s integrity. We also decided not to choose the free-riding problem (or a similar standard VCM) by itself because the dominant strategy of every player including the leader is simply not to invest in such environments. Leaders in previous studies, such as Potters et al. (2005, 2007) and Komai et al. (2011), were unable to significantly generate cooperative outcomes from leadership in circumstances where information was complete and “not cooperating” was the dominant strategy and the benchmark prediction. To increase the possibility of cooperative outcomes, we decided to use a game in which “not investing” (although still an equilibrium strategy) is no longer the dominant strategy of all players.

Hence, we chose the familiar design of Komai et al. (2011) in which return uncertainty (two equally likely problems) and information asymmetry create a more cooperative alternative to the benchmark (zero investment) equilibrium. Summarizing: The coordination problem is essential for the existence of the more cooperative equilibrium which is likely to enhance leadership and the free-riding problem is essential in addressing leader’s integrity.¹⁷

4. Procedures

Participants were recruited in multiples of three using ORSEE

¹⁷ Our game design shares similarities with the game in Cooper et al. (2016). Their game has six pay-off possibilities varying with the quality of the investment opportunity. In any period, a noisy signal regarding the actual investment quality is provided to the group advisor who sends an Invest/Not Invest, cheap-talk message to the investors. The incentives of advisor and investors do not perfectly align. For the lowest quality level, both advisor and investors want no investment, for the highest three quality levels, both advisor and investors want full investment. For two intermediate quality levels, the advisor wants full investment while investors do better if there is no investing. They report that leaders often sacrifice their own short-term earnings for higher long-term earnings. Self-interested bad advice results in investors not responding to the invest signals from their advisors when quality levels are high.

(Greiner, 2015). The experiments were computerized using zTree (Fischbacher, 2007). All sessions were conducted at Monash University's MonLEE laboratory. A typical session lasted between 60 and 90 min.

Participants are seated at individual workstations and randomly assigned unique ID numbers. After participants sign consent forms, they complete the individually-administered surveys (see Appendix A for detailed instructions and materials). Survey 1 collects socioeconomic information. Survey 2 is either a 15-statement integrity survey adapted from Becker and Ulstad's (2007) 20-statement survey or a 14-statement driving skill survey adapted from Clapp et al. (2011).¹⁸ All surveys are administered before instructions for the investment game to minimize strategic responses by subjects. The Integrity survey includes statements of the variety: "I always obey laws, even if I am unlikely to get caught" and responses were on a 10-point Likert scale with 1 = not true and 10 = very true. An integrity score equal to the sum of the 15 responses is calculated. The Driving skill survey includes statements of the variety: "I have trouble staying in the correct lane" and responses were on a 7-point Likert scale with 1 = never and 7 = always. A Driving skill score equal to the sum of the 14 responses is calculated.

Participants completing the Integrity survey are informed that the survey had previously been administered to 184 university students and that their results would be interpreted relative to this group and placed into top, middle, or bottom one-third categories of integrity relative to this 184-student normative distribution. Participants completing the Driving skill survey are similarly informed that the survey had previously been administered to 167 university students and that based on comparison with the scores for those students, participants would be classified as being in the relative top, middle, or bottom one-third categorization of driving skills, respectively. Integrity and driving categories are based on the individuals' responses to the respective surveys.¹⁹ Across all experimental conditions, participants are never given personal feedback on *their own specific scores* or *their own category*.

The investment game instructions are then distributed and read aloud by the proctor. Participants are randomly assigned to a group and are informed of their randomly determined type (one Type A [aka leader, although the word "leader" is never mentioned in the protocol] and two Type Bs [aka followers, although this word is similarly never mentioned]). Upon completion of the experiment, participants are paid their earnings in private and dismissed.

5. Treatments and research questions

We administered three treatments and a baseline:

¹⁸ Becker and Ulstad (2007) used the survey to assess gender differences in student ethics. To provide evidence of construct validity of the focal study integrity measure (Becker and Ulstad, 2007), we ran an independent validation study (n 's = 53 Economics students at Saint Cloud State University), administering the focal measure along with two alternative integrity measures (the Abbreviated Reid Report [Fortmann et al., 2002] and the Integrity Scale [Schlenker, 2008]). The "Avoidance of Similarity" subscale of the Consumers Need for Uniqueness scale was also administered as a discriminant validation measure (Tian et al., 2001). The results are consistent with expectations (all integrity measures yielded moderate intercorrelations and insignificant correlations with the discriminant measure, although the magnitude of the convergent indices (for all scales) indicates a nontrivial level of uniqueness across all three integrity scales.

¹⁹ Subjects complete the surveys without knowing that their categories might be revealed at a later stage in the experiment. Informing the subjects of the possibility of a future reveal might have incentivized subjects to bias their answers, especially in the integrity survey. In such a case, followers would have no reason to take their leaders' integrity category as reliable, defeating the purpose of this study. This was necessary to garner more truthful responses. Even so, subjects may still have biased their responses to look good. Ultimately, our study examines the effect of cheap-talk integrity on cheap-talk messages.

Integrity Treatment (Integrity): In Integrity, followers are presented with both the leader's suggestion and whether the leader's integrity score placed the leader in the top, middle, or bottom one-third of scores relative to the normative sample. We conjecture that, when a leader's integrity category is revealed, the invest suggestions from high-integrity leaders may be given more credence, leading to higher levels of investment by followers.

Random Member Integrity Treatment (Random): In Random, all group members are presented with the leader's suggestion as well as the integrity category of *one randomly selected group member*, either the leader or one of the two followers. Members are not informed whose integrity category is revealed.²⁰ They are told that the randomly selected member's score placed the anonymous member in the top, middle, or bottom one-third of scores relative to the comparison sample. Including this treatment investigates whether any finding for the Integrity treatment is due to an integrity score reveal, or the fact that it is the leader's integrity score that is revealed.²¹

Driving Skill Treatment (Driving): In Driving, followers are presented with both their leader's suggestion and whether their leader's driving score placed the leader in the top, middle, or bottom one-third of scores relative to the normative sample. Driving skill is an information reveal about the leader that should be irrelevant to levels of follower investment. Including this treatment ensures that any finding for the Integrity treatment is due to the nature of the information revealed, not just to the fact that information about the leader is revealed.

Baseline: In our Baseline, while all participants completed the integrity survey, integrity categories are not reported. Followers are presented with only their leader's suggestion before making their decisions. In the Baseline treatment, followers' behavior should not deviate across the leaders' integrity category (which is recorded but not revealed).

To maximize observations for leaders, we use a strategy design; leaders make costless suggestions and investment decisions for both possible problems.

We focus on two primary research questions:

RQ1: Given that a leader has sent an invest suggestion, is the follower more likely to follow this suggestion if the leader is described as being of high integrity?

RQ2: Are high-integrity leaders more likely to act consistently with their invest suggestions?

A total of 570 individuals (30 sessions, 190 leaders and 380 followers) participated in the experiment: 156 in the Baseline treatment (8 sessions, 52 leaders), 162 (8 sessions, 54 leaders) in Integrity, 111 (6 sessions, 37 leaders) in Driving, and 141 (8 sessions, 47 leaders) in Random. Session sizes ranged between 12 and 24 subjects. Appendix B, Table 1, reports subject characteristics for leaders and followers by treatment.²² Participants earned, on average, AUD \$23.50, which included a \$10 survey completion fee.

²⁰ It is possible the random group member is revealed to be of high [medium] (low) integrity. If followers believe themselves to be of low or medium [high or low] (high or medium) integrity, they know that the leader has a 50% chance of being of high [medium] (low) integrity. However, as subjects were not provided feedback with respect to their own integrity (driving) scores, this would all be conjecture.

²¹ As group size increases, the leader position becomes more focal relative to that of followers. The Komai et al. (2011) three-player game allows us to address this distinction by investigating the relative importance of the leader's integrity compared to other group members.

²² In general, there are few significant (p -value < 0.10) differences in subject characteristics across treatments or between leaders and followers. The exceptions include a significant difference in Age of leaders (Kruskal-Wallis test p -value = 0.07) and Employed leaders (Kruskal-Wallis test p -value = 0.04), in Economics Classes between leaders and followers in the Integrity treatment (t test p -value = 0.03), and in Employed between leaders and followers in the Driving treatment (Proportions test p -value = 0.09).

Table 2
Distribution of leaders and followers by category and treatment.

Panel A: Within Treatment							
Role	1	2	3	4	5		
	Row	Information Provided	Treatment (n)	Category High	Average/Low	Contingency Table Test χ^2 statistic (p-value)	
Leaders	1	Revealed	Integrity (54)	35 (64.8%)	19 (35.2%)	5.24 (0.15)	
	2a	Actual	Random (47)	31 (66.0%)	16 (34.0%)	3.60 (0.31)	
	2b		Random (47)	27 (57.4%)	20 (42.6%)		
	3		Driving (37)	17 (45.9%)	20 (54.0%)		
	4		Baseline (52)	27 (51.9%)	25 (48.1%)		
	Followers	5	Actual	Integrity (108)	69 (63.9%)	39 (36.1%)	8.10 (0.04)
		6		Random (94)	63 (67.0%)	31 (33.0%)	
		7		Driving (74)	38 (51.4%)	36 (48.6%)	
8			Baseline (104)	53 (51.0%)	51 (49.0%)		
Panel B: Across Player Type (Actual)							
1	2		3	Contingency Table Test χ^2 statistic (p-value)			
Leaders v Followers		Integrity		0.01 (0.91)			
		Random		1.24 (0.27)			
		Driving		0.29 (0.59)			
		Baseline		0.01 (0.91)			

Note: The reported data in rows 1 – 4 are:.
 Revealed (=actual) integrity category of leaders in the Integrity treatment (Row 1);
 Revealed integrity category of random group members in the Random treatment (Row 2A);
 Actual integrity category of leaders in the Random treatment (Row 2B);
 Revealed (=actual) driving skill category of leaders in the Driving treatment (Row 3); and.
 Unrevealed actual integrity category of the leaders in the Baseline treatment (Row 4).
 In rows 5 – 8, we report the relevant actual categories for followers.

Table 3
Followers' actions when leaders suggest invest by treatment.

Treatment (n)	Followers' Actions ^a		Contingency Table Test χ^2 statistic (p-value)
	Invest (%)	Not Invest (%)	
1	2	3	4
Integrity (92)	60 (65.2%)	32 (34.8%)	4.13 (0.25)
Random (88)	67 (76.1%)	21 (23.9%)	
Driving (60)	37 (61.7%)	23 (28.3%)	
Baseline (92)	62 (67.4%)	30 (32.6%)	

^a Contingency on observing an invest signal from the leader.

6. Results

6.1. Summary statistics

Table 2 reports the breakdown for both actual and revealed scores. For the Random treatment, we report the distribution of both leaders' actual scores and the randomly selected scores revealed to followers. In

the Integrity and Driving treatments, there is no distinction between leaders' actual and revealed scores. For the Baseline treatment, we report leaders' actual unrevealed scores. The data for followers is based on their actual survey scores.

Our participants exhibit elevated scores along both integrity and driving surveys when compared to the respective normative samples (Table 2). A disproportionate number of our participants are therefore categorized as "high" (59.7% on the integrity survey and 49.5% on the driving survey). We combine average and low for our analysis and treat this as our omitted category.

Contingency table tests indicate no significant difference in the distributions of (revealed or actual) leaders' categories across treatments (Table 2: Panel A, Column 5, lowest $p \geq 0.10$). We do find a significant difference in the distributions of actual followers' categories across treatments (Table 2: Panel A, Column 5, $p = 0.04$); there are fewer high category followers in the Driving and Baseline treatments. We find no significant difference in the distributions of actual categories between leaders and followers (Table 2: Panel B, Column 3, lowest $p \geq 0.25$).

6.2. Followers' behavior

Of the 380 suggestions observed by followers, 332 (87.4%) are invest

Table 4
Probit regression: Followers' responses to leaders' invest suggestions.^α

Variable	Marginal Effect ^β (Std. Err.) ^γ	
Integrity	-0.021 (0.05)	-0.004 (0.05)
Driving	-0.054 (0.06)	-0.034 (0.05)
Random	0.092* (0.05)	0.102** (0.05)
Age		-0.005 (0.01)
Male		-0.167*** (0.05)
Employed		0.000 (0.05)
Economics Classes		-0.000 (0.01)
(Pseudo) R ²	0.010	0.040
Test Demographics = 0 p-value		0.009
N	332	

Note. Dependent Variable: Invested (= 1 if a follower invested).

^α Followers who observed an invest suggestion.

^β Calculated at mean.

^γ Standard errors cluster at the session level. ***, **, * significance at 1%, 5%, 10% level.

Table 5
Followers' actions when leaders suggest invest by category and treatment^α.

Panel A				
Treatment (n)	Observed Category	Followers' Action (%)		Contingency Table Test χ ² statistic (p-value)
		Invest	Not Invest	
1	2	3	4	5
Integrity	High (60)	47 (78.3%)	13 (21.7%)	13.08 (< 0.001)
	Average/Low (32)	13 (40.6%)	19 (59.4%)	
Random	High (52)	40 (76.9%)	12 (23.1%)	0.04 (0.84)
	Average/Low (36)	27 (75.0%)	9 (25.0%)	
Driving	High (26)	16 (61.5%)	10 (38.5%)	0.0003 (0.99)
	Average/Low (34)	21 (61.8%)	13 (38.2%)	
Baseline	NA (92)	62 (67.4%)	30 (32.6%)	NA
Panel B				
Contingency Table Test: Across treatments by revealed category ^β				
1	2			
Revealed Category	χ ² statistic (p-value)			
High	2.93 (0.23)			
Average/Low	8.41 (0.02)			

^α Followers who observed an invest suggestion (We do not report data for the Leaders' Not Invest suggestions. Not Invest suggestions led overwhelmingly to not invest actions).

^β Excludes Baseline.

suggestions. For the following analysis, we focus on those followers who observed an invest suggestion from their leaders. Our primary interest is whether or not followers evaluate a cheap-talk invest suggestion more favorably if the suggestion is received from a leader categorized as of high integrity compared to a suggestion from a leader of average/low integrity.

RQ1: Are followers more likely to follow an invest suggestion by a leader if the leader is described as being of high integrity?

Table 6
Probit regression: Followers' investment behavior within revealed category^α.

1 Variable	Marginal Effects (Std. Err.) ^β			
	2 High ^γ	3	4 Average/Low ^γ	5
Integrity	0.160** (0.08)	0.169** (0.07)	-0.253*** (0.08)	-0.235*** (0.08)
Random	0.144** (0.06)	0.149** (0.06)	0.069 (0.08)	0.066 (0.08)
Age		-0.008 (0.01)		0.000 (0.02)
Male		-0.202** (0.07)		-0.102 (0.07)
Employed		-0.002 (0.06)		0.004 (0.08)
Economics Classes		0.000 (0.01)		0.006 (0.02)
(Pseudo) R ²	0.025	0.082	0.052	0.062
Test: Integrity = Random = 0 p-value	0.042	0.018	0.001	0.008
Test Demographics = 0 p-value		0.011		0.694
N	188		144	

Note. Dependent Variable: Invested (= 1 if a follower invested and 0 otherwise).

^α Sample restricted to followers who received an invest suggestion from their leaders.

^β Standard errors clustered at the session level.

^γ Revealed category. Omitted treatment = Driving; ***, ** significance at 1%, 5% level.

Result Summary:

Ignoring category, on average, the frequency at which followers invest having observed an invest suggestion from their leader does not differ significantly across the four treatments. Nevertheless, the integrity categorization of leaders and, to a lesser degree, that of randomly selected group members matters.

Holding revealed categories constant:

In the two treatments in which an integrity categorization is revealed (Integrity and Random treatments), followers invest at a significantly higher rate than they do in the Driving treatment, within the high integrity category.

In the Integrity (but not the Random category), followers invest at a significantly lower rate than they do in the Driving treatment. within the average/low integrity category.

Holding treatment constant:

Within the Integrity Treatment, followers receiving invest suggestions from leaders categorized as average/low integrity invest at approximately half the rate as followers receiving the same suggestions from leaders categorized as high integrity.

On average, of the 332 followers observing an invest suggestion, 226 (68.1%) chose to heed their leaders' suggestion and invest.²³ A Chi-square test finds no significant difference in the invest decisions of followers by treatment (Table 3, Column 4, $p = 0.25$).

Table 4 reports Probit regression results.²⁴ Our dependent variable is Invested (= 1 if the follower invested, 0 otherwise). We control for our treatments and followers' characteristics: Age; Male, = 1 if yes; Employed, = 1 if employed full or part-time; and Economics Classes, = number of classes reported taken. Baseline is our omitted treatment. Standard errors are clustered at the session level.

Results indicate that followers' willingness to invest when observing an invest suggestion from their leaders does not, on average, differ across our Baseline, Integrity, and Driving treatments. In the Random

²³ Fifteen of the followers observing one of the 48 not invest suggestion invested.

²⁴ Similar results are found using a Linear Probability model (Appendix B Table 2).

Table 7
Leaders' suggestion/action combination by treatment and problem.

Panel A: Across Treatments by Problem				
1	2	3	4	5
Problem	Treatment (n)	Is/Ia	All Others	Contingency Table Test χ^2 statistic (p-value)
Coordination	Integrity (54)	42 (77.8%)	12 (22.2%)	0.804 (0.85)
	Random (47)	36 (76.6%)	11 (23.4%)	
	Driving (37)	31 (83.8%)	6 (16.2%)	
	Baseline (52)	40 (76.9%)	12 (23.1%)	
	Free Riding	Integrity (54)	11 (20.4%)	
	Random (47)	14 (29.8%)	33 (70.2%)	
	Driving (37)	11 (29.7%)	26 (70.3%)	
	Baseline (52)	14 (26.9%)	38 (73.1%)	

Panel B: Across Problem and Category Is/Ia vs All Others			
Contingency Table Test χ^2 statistic (p-value)			
Coordination	Average/Low	Free Riding	Average/Low
High		High	
1.11 (0.78)	2.02 (0.57)	2.46 (0.48)	0.83 (0.84)

Table 8
Probit regression: Leaders' commitment to own invest suggestions, by problem.

Variable	Coefficient (Std. Err.) ^a			
	Coordination	Free Riding	High	Average/Low
Integrity	0.008 (0.08)	0.019 (0.08)	-0.069 (0.09)	-0.028 (0.09)
Random	-0.003 (0.08)	0.001 (0.08)	0.027 (0.08)	0.031 (0.07)
Driving	0.073 (0.12)	0.071 (0.13)	0.027 (0.07)	0.039 (0.07)
Age		0.004 (0.005)	0.018*** (0.007)	
Male		-0.015 (0.06)	-0.050 (0.07)	
Employed		-0.026 (0.06)	-0.107 (0.09)	
Economics Classes		-0.008 (0.01)	-0.021 (0.02)	
(Pseudo) R ²	0.004	0.010	0.007	0.083
Test: Demographics = 0 p-value		0.791		0.024
N	190	190		

Note. Dependent Variable: Commit (= 1 if a leader's suggestion/action choice is Is/Ia and 0 otherwise). Omitted treatment is Baseline.

*** significance at < 1% level.

^a Standard errors cluster at the session level.

treatment, however, followers' likelihood of investing when observing an invest suggestion from their leaders is approximately 10 percentage points more than that in the Baseline treatment (p-value < 0.10). However, as we show below in Table 5, Panel A, and Appendix B, Table 3, the greater likelihood of followers in the Random treatment investing is independent of the revealed integrity category.

In Table 5 Panel A, we compare the difference in followers'

Table 9
Leaders' suggestion/action combination by treatment, category, and problem.

Treatment	Problem	Category (n)	Suggestion/Action Combination (%)		Contingency Table Test $\chi^2(2)$ statistic (p-value)	
			Is/Ia	All others		
1 Integrity	Coordination	3 High (35)	4 (85.7%)	5 (14.3%)	3.63 (0.06)	
		4 Average/Low (19)	12 (63.2%)	7 (36.8%)		
		7 Free Riding (35)	7 (20.0%)	28 (80.0%)		0.01 (0.93)
		4 Average/Low (19)	4 (21.1%)	15 (78.9%)		
		Random	Coordination	3 High (27)		23 (85.2%)
13 Average/Low (20)	13 (65.0%)			7 (35.0%)		
10 Free Riding (27)	10 (37.0%)			17 (63.0%)	1.59 (0.21)	
4 Average/Low (20)	4 (20.0%)			16 (80.0%)		
Driving	Coordination			3 High (17)	15 (88.2%)	2 (17.8%)
		16 Average/Low (20)	16 (80.0%)	4 (20.0%)		
		5 Free Riding (17)	5 (29.4%)	12 (70.6%)	0.002 (0.97)	
		6 Average/Low (20)	6 (30.0%)	14 (70.0%)		
		Baseline	Coordination	3 High (27)	21 (77.8%)	6 (21.2%)
19 Average/Low (25)	19 (76.0%)			6 (24.0%)		
9 Free Riding (27)	9 (33.3%)			18 (66.7%)	1.17 (0.28)	
5 Average/Low (25)	5 (20.0%)			20 (80.0%)		

investment rates by revealed categories within each treatment. In the Integrity Treatment, followers receiving an invest suggestion from a leader categorized as average/low integrity invest at approximately half the rate as followers receiving the same suggestion from a leader categorized as high in the Integrity treatment (Table 5, Panel A, column 5, $p < 0.001$). In the Random and Driving treatments, followers' decisions to invest are independent of the observed category (Panel A, column 5, lowest $p \geq 0.80$). Probit regressions reported in Appendix B Table 3 offer support for these nonparametric results.

In Table 5 Panel B, we compare the difference in followers' investment rates by treatment holding revealed category constant. For the high revealed category, nonparametric test results suggest no significant difference across treatments in followers' willingness to invest when their leaders suggest invest (Table 5, Panel B, column 2, $p = 0.23$). Invest rates range between 62% in the Driving treatment to 78% in the Integrity treatment. When the revealed category is average/low, followers receiving an invest suggestion from a leader in the Integrity treatment are significantly less likely to invest (Table 5, Panel B, column 2, $p = 0.02$).

Table 10
 Probit regressions: Leaders' commitment to own invest suggestions, by treatment and problem.

Variable	Marginal Effect ^a (Std. Err.)				Driving ^c	
	Coordination Integrity	Random	Random	Driving ^c	Driving ^c	Driving ^c
High ^b	0.174* (0.10)	0.218** (0.11)	0.020 (0.13)	0.010 (0.12)	0.099 (0.11)	0.125 (0.11)
Age		0.005 (0.01)		0.007 (0.01)		-0.013 (0.02)
Male		0.063 (0.11)		-0.116 (0.12)		0.107 (0.10)
Employed		-0.128 (0.12)		-0.131 (0.13)		
Economics Classes		-0.002 (0.02)		-0.017 (0.02)		-0.015 (0.02)
(Pseudo) R ²	0.046	0.078	0.001	0.086	0.033	0.098
Test Demographics = 0 p-value		0.681		0.361		0.605
N	53		45		35	
	Free-Riding Integrity		Random		Driving	
High	-0.048 (0.15)	-0.047 (0.15)	-0.062 (0.16)	-0.006 (0.11)	-0.020 (0.17)	-0.061 (0.18)
Age		0.014 (0.10)		0.023** (0.02)		-0.058 (0.05)
Male		-0.073 (0.14)		0.53 (0.11)		-0.030 (0.17)
Employed		0.073 (0.14)		-0.360 (0.11)		0.560** (0.26)
Economics Classes		0.019 (0.03)		-0.165** (0.07)		-0.027 (0.04)
(Pseudo) R ²	0.002	0.074	0.003	0.356	0.0003	0.101
Test Demographics = 0 p-value		0.546		0.029		0.195
N	40		41		32	

Note. Sample restricted to leaders who sent an Is suggestion. Dependent Variable: Commit (= 1 if a leader's suggestion/action choice is Is/Ia and 0 otherwise). **, * significance at < 5%, < 10% level.

^a Huber/White robust standard errors (too few sessions to cluster).

^b Actual category. Omitted category is Average/Low.

In Table 6, we run separate regressions for each revealed category. Our dependent variable is Invest (= 1 if the follower invested, 0 otherwise).²⁵ We control for treatments (driving is our omitted category) and followers' characteristics (Age, Male, Employed, and Economics Classes). The High category reveal regressions (Table 6, columns 2 and 3) show that followers are significantly more likely to invest in the Integrity and Random treatments (by approximately 15 percentage points). The Average/low category reveal regressions (Table 6, columns 4 and 5) show that followers are significantly less likely to invest in the Integrity treatment (by approximately 24 percentage points).

These results suggest that integrity as a character trait matters in collective actions. Followers are significantly more likely to invest in both the Integrity and Random treatments when either their leader or, to a lesser extent, a possibly less pivotal team member is revealed to be of high integrity (see Table 6). Knowing that at least one member of the group is of high integrity makes cooperation more probable. A team with an average/low integrity leader suffers from lower follower cooperation. Followers are significantly less likely to invest in the Integrity (but not the Random) treatment in the average/low regressions. When a leader is identified to be of average/low integrity, a diversion from leaders' integrity category to a less relevant trait represented by the Driving Treatment seems to attract more follower cooperation.

6.3. Leaders' behavior

RQ2: Are high-integrity leaders more likely to act consistently with (or

²⁵ Similar results are found using a Linear Probability model (Appendix B Table 4).

commit to) their invest suggestions?

Result Summary: On average, and regardless of the problem, the leaders' commitment to their investment suggestions does not differ significantly across categories, within and across treatments. Leaders, regardless of the treatment, are more likely to invest after suggesting their followers invest for the Coordination problem than for the Free-Riding problem).²⁶

A leader can make one of four possible suggestion/action combinations: suggest invest/invest (Is/Ia), suggest invest/not invest (Is/NiA), suggest not invest/invest (NIs/Ia), and suggest not invest/not invest (NIs/NiA).²⁷ Across the four treatments, for the Coordination problem, 78.4% (149/190) of the suggestion/action combinations are Is/Ia; for the Free-Riding problem, only 26.3% (50/190) of the suggestion/action combinations are Is/Ia.²⁸ Chi-squared tests indicate for both problems no significant difference across treatments in the suggestion/action combinations chosen (Table 7, Panel A, Column 5, lowest $p \geq 0.65$). In

²⁶ For the Integrity treatment's Coordination problem only, leaders categorized as high integrity are marginally more likely to commit. One can expect integrity scores to correlate with commitment (at least to some extent). That noted, self-interest can also be a very strong factor. Our leaders' commitment (or lack thereof) to their suggestion in the coordination (free-riding) scenario suggests that self-interest dominates in our experiment.

²⁷ NIs/NiA also represents commitment on the part of a leader. However, NIs/NiA accounts for less than 10% of all action/suggestion decisions. And a not invest suggestion cannot be used to exploit followers, most importantly because followers interpret a not invest suggestion as a strong signal to not invest and few do other than that.

²⁸ By comparison, 16.8% (32/190) [56.3% (107/190)] action/suggestions combinations are Is/NiA for the Coordination problem [Free-Rider problem].

Table 7, Panel B, we compare suggestion/action combinations across treatments by problem and within category. Holding category constant, leaders' suggestion/action combinations for both the Coordination and the Free-Riding problem do not differ across treatments (χ^2 test lowest $p \geq 0.45$).

The nonparametric results are supported by the Probit regression results reported in Table 8, Panel A.²⁹ Our dependent variable is Commit (= 1 if a leader's suggestion/action choice is Is/Ia, 0 otherwise). We control for our treatments (with Baseline as our omitted treatment) and leaders' characteristics (Age, Male, Employed, and Economics Classes). Robust standard errors are reported. There is no significant difference in committing across treatments for either problem.

Table 9 reports leaders' likelihood of committing (choosing Is/Ia) by treatment, problem, and category. Within treatments and by problem, there is no significant difference by leader category in leaders' likelihood of committing (choosing Is/Ia) (Column 6, lowest $p > 0.11$), with one exception. For the Integrity treatment's Coordination problem, leaders categorized as high integrity are marginally more likely to commit (choose Is/Ia) ($p = 0.06$).

This nonparametric result is supported by Probit regression results reported in Table 10.³⁰ We estimate regression models for each problem separately for the three treatments. Our dependent variable is Commit (= 1 if a leader's suggestion/action choice is Is/Ia, 0 otherwise). We control for the High category and leaders' characteristics (Age, Male, Employed, and Economics Classes). Our omitted category is Average/Low. Robust standard errors are reported. Only for the Integrity treatment and for the Coordination problem do we find that high-integrity leaders are more likely than their average/low counterparts to invest having sent an Is suggestion.

7. Discussion and conclusion

We investigate how information regarding leaders' integrity may affect group behavior in an environment where leaders can privately benefit from deceiving (encouraging their followers to invest in a project without actually investing themselves) their followers. We attempt to push the limits of cheap-talk suggestions by having the suggestion come from leaders varying in integrity description (in addition to comparison conditions stripped of the decision-relevant integrity information, such as past driving behavior).

Similar to d'Adda et al. (2017), we find that the purported ethics, or in our case lower integrity, of leaders do matter for followers' behavior. In our two treatments in which an integrity categorization is revealed (Integrity and Random treatments), followers invest at a significantly higher rate than they do in the Driving treatment, within the high integrity category, and the Baseline overall. Within the Integrity Treatment, followers receiving invest suggestions from leaders categorized as average/low integrity invest at approximately half the rate as followers receiving the same suggestions from leaders categorized as high integrity. The revelation that a random member is categorized as average/low integrity does not negatively affect followers' investment rates. Other information about leaders is uncorrelated with followers' decisions to invest.³¹ We also find that, on average, and regardless of the problem, the leaders' commitment to their investment suggestions does not differ significantly across categories within and across the Baseline

²⁹ Similar results are found using a Linear Probability model (Appendix B Table 5).

³⁰ Similar results are found using a Linear Probability model (Appendix B Table 6).

³¹ On average, followers' willingness to invest when observing an invest suggestion from their leaders does not differ across our Baseline and three treatments. In the Random Treatment, however, followers' likelihood of investing when observing an invest suggestion from their leaders is statistically larger than it that in the Baseline.

and our three treatments.³²

Our findings have implications for the study of leadership within the fields of Economics and Psychology/Management, but also represent an advancement in bringing these largely segregated literatures together. Within the Psychology/Management literature, our findings build on previous investigations of leader ethics and contribute through directly testing integrity under controlled conditions (via experimentation). Within Economics, our study contributes to emerging investigations acknowledging the role individual characteristics may play in leader effectiveness. We note that Zehnder et al. (2017) claim that *all* research on leadership can benefit from mutually addressing these heretofore segregated approaches.

The results of this study also have implications for the practical implementation of leadership. These findings certainly suggest that training in ethical leadership may have behavioral implications, for example. When we isolate the actions of both leaders and followers via experimentation, we find that, by and large, followers trust their leaders (e.g., follow their suggestions), but this trust is undermined when there is a perception that the leader is of less than high integrity. It is not only true that the leader coordinates action; it is also likely that the followers' experiences and responses have an impact on the leader. High-integrity leaders may benefit in this perspective from their personal level of integrity. Future like-minded investigations could certainly probe for such an effect by incorporating some element of feedback into a protocol such as ours. Future investigations may also benefit from longitudinal investigations, where follower "loyalty" could be investigated under conditions that either maintain or violate commitment.

Our integrity survey is not a perfect indicator of subjects' integrity partly because it is not based on actual past behavior, which also may explain why in the Free-Riding problem leaders of different integrity categories show no behavioral differences.³³ Self-claimed integrity fails when having integrity means foregoing private benefits. We cannot completely dismiss this argument.³⁴ What is interesting, however, is that followers in the integrity treatment do indeed respond to our measure of integrity; they are less likely to invest having received an invest suggestion from an average/low integrity leader. It is possible that this finding may be unique within the one-shot nature of our game. In a repeated-play game with the possibility of reciprocity, the power of integrity to direct actions may be enhanced.

Data availability

Data will be made available on request.

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³² In all instances, leaders are more likely to invest after suggesting their followers invest for the Coordination problem than for the Free-Riding problem. If we define leader integrity as consistency between actions and suggestions, then one may reasonably argue that integrity (like many other human traits) is responsive to costs and benefits. A majority of our high-integrity leaders choose to follow their equilibrium strategy, maximizing their private benefit. This finding is consistent with evidence from the deception literature, where lying is found to increase the greater are the benefits from doing so (see, for example, Gneezy, 2005; Gibson et al., 2013).

³³ In real life, many claims of integrity, for example, by politicians, are little more than self-assessed cheap-talk signals, not always open to easy verification.

³⁴ Grossman and Komai (2019) find that leaders who exhibit greater generosity in a Dictator game and higher levels of trust and trustworthiness as first and second movers respectively, in a Trust game, are significantly more likely to invest when they send an invest suggestion, even in a Free-Riding problem.

Supplementary materials

Supplementary material associated with this article can be found, in the online version, at doi:10.1016/j.socec.2023.101997.

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