

# The Effects of Incentive System and Cognitive Orientation on Teams' Performance

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**ABSTRACT:** Organizations are adopting team-based structures to promote cooperation and coordination of actions and, thus, enhance performance ([Libby and Thorne 2009](#); [Chenhall 2008](#)). However, team-based structures do not automatically improve performance because of the potential conflict between individual and group incentives. In contrast, the organizational behavior literature argues that working in teams may enhance performance via members' collectivist cognitive orientation. This paper analyzes how both the economic incentive system and the team's predominant (individualist or collectivist) cognitive orientation affect team performance. We conduct an experiment with postgraduate students. Our results show that enhanced team performance is positively related to both individual economic incentives and predominantly collectivist orientation in the team, and that the effectiveness of any incentive system design seems to be related to the team's predominant cognitive orientation.

**Keywords:** incentive systems; cognitive orientation; teamwork; performance.

## INTRODUCTION

To develop and maintain competitive advantage, many firms have shifted from an individual to a team-based structure ([Katzenbach and Smith 1994](#); [Chenhall 2008](#)). A team can be defined as a collection of individuals with different skills, who are interdependent in their tasks and work toward a common goal ([Cohen and Bailey 1997](#); [Katzenbach and Smith 1994](#)). Generally, team-based structures promote cooperation and coordination of processes and actions in order to make organizations more flexible ([Mohrman et al. 1995](#); [Towry 2003](#)), and with the intention of improving organizational performance. However, establishing these structures does not automatically improve organizational performance. Instead, teams may perform poorly due to

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conflicts in decision making between team members and shirking by some members of the team (Finkelstein and Hambrick 1996; Denison et al. 1996). The question, therefore, is how team performance can be sustained and improved (Young et al. 2001; Merchant et al. 2003). One answer is to design incentives that motivate performance and reduce the potential that team members will shirk (Mohrman et al. 1995; Kelly 2010). Traditionally, individual incentive systems are accused of encouraging competition and conflict among employees instead of promoting the cooperative behavior necessary in a team environment (Abernethy and Lillis 1995; Parker et al. 2009). Thus, for performance measurement systems to be effective for teams performing tasks requiring interaction and cooperation between team members, their designers must be continually sensitive to the motivational factors affecting workers' behavior in teams (Towry 2003).

This paper aims to reconcile opposite lines of argument in two literatures. The economic literature suggests that group-based incentives give team members an incentive not to carry out their work in a responsible way, contending that productivity per worker will be lower under group incentives than under individual incentives. However, the organizational behavior literature suggests that group-based incentives may enhance team member motivation and effectiveness because they are better suited to a team-based structure. We argue that in a group setting, some sensitivity to the dynamics of interpersonal interactions can inform the design of performance evaluation and reward systems. The study of the influence of social motives and values on the design and use of managerial accounting information is an important avenue of managerial accounting research (Sprinkle 2003). In this study, we combine insights from the organizational behavior literature on individualist and collectivist cognitive orientations and the economic literature on incentive system design, to explore how cognitive orientation moderates the relationship between incentive schemes and team performance.

This research contributes to management accounting literature in several ways. First, we attempt to shed some light on how individual versus group-based incentive schemes affect performance of team tasks, an important issue in management accounting. Second, we combine psychological and economic theory by examining whether the predominant cognitive orientation of the team (individualist versus collectivist) is an important motivational factor that can affect workers' behaviors in teams. Third, in exploring the appropriate alignment between incentive schemes and the cognitive orientation of the team, we contribute to the relatively scarce experimental research in the accounting literature regarding this topic (Sprinkle 2003; Libby and Thorne 2009).

The remainder of this paper is structured as follows. The second section reviews the literatures in economics and organizational behavior that address rewarding teams in organizations, and then develops our hypotheses. The third section describes the experiment that was designed and executed to test these hypotheses. Last, we discuss empirical results, showing the main conclusions.

## HYPOTHESES DEVELOPMENT

Traditional production methods involve mass production of standardized products or services (Banker et al. 1993). In this setting, workers typically carry out a single very specialized task (Young 1992). Nowadays, many organizations are moving toward more flexible, collaborative, and interdependent production environments, where self-managed work-teams produce a great variety of customized products and workers carry out a multitude of different tasks (Ellemers et al. 2004; Chenhall 2008). Such teams can make quicker decisions and be more effective in the face of intense global competition (Dunphy and Bryant 1996); also, collaborative efforts are considered the most effective way to develop diversity in knowledge and competence. Work-teams' potential advantages include enhancing the efficiency of organizational processes, integrating different competencies and perspectives to produce innovation, and improving interfirm relationships (Stock

and Tatikonda 2004). However, in practice, different firms have very different experiences when they implement new, collaborative work settings. One of the reasons may be the lack of suitable incentive systems to coordinate, motivate, and commit workers to team performance (Abernethy and Lillis 1995; Che and Yoo 2001).

Incentive systems can be defined as all practices or techniques used by organizations to assure appropriate worker behaviors, with the goal of improving employee productivity in particular, and organizational performance in general (Chow et al. 1996; Chenhall 2003). Incentive systems have been used to reward or punish certain behaviors (Young et al. 1988; Kelly 2010). Traditionally, they were focused on individual incentives and designed to be sensitive to motivational factors affecting individual actions; also, traditionally, they encouraged competition among workers (Dickinson and Gillette 1993; Abernethy and Lillis 1995). However, accounting research has highlighted that incentive systems are more effective when they are suited to organizational environments (Young and Selto 1991). Current, more cooperative environments are demanding new incentive systems to promote coordination, participation, and interactive behaviors (Towry 2003; Libby and Thorne 2009).

Team-based structures need special systems of organizational control. The literature on organizational behavior suggests that group-based incentives can increase team members' cooperation, motivation, and effort (Triandis and Gelfand 1998; Towry 2003; Kelly 2010). According to Dawes (1980), there are two critical factors that motivate individuals to cooperate. First, people need to consider and understand their incentives. Second, individuals should have some reason to believe that other team members will also cooperate. In other words, commitment to cooperative behaviors depends on accurate information, recognition, and suitable incentives (Mohrman et al. 1995). However, Dawes (1980) shows that there are often members who refuse to collaborate and who put little effort into the team, yet receive the same rewards as other team members. That is, as agency theory predicts, group-based incentives, without appropriate control, are likely to impair group productivity.

Experimental accounting research has focused mainly on individual measures of performance (Bonner et al. 2000; Sprinkle 2003). Individual incentives seem to provide a stronger relationship between compensation and performance because—to the extent that performance depends on effort, rather than exogenous factors like business climate—these incentives depend only on (relatively simple) individual effort and not on (more complex) team productivity (Honeywell-Johnson and Dickinson 1999). The underlying idea is that individual incentives are likely to result in higher performance than group incentives, because the link between a person's pay and his or her performance is tighter (Bucklin and Dickinson 2001). Traditional agency theory contends that team performance will be lower under group incentives than under individual incentives, because the former arrangements weaken the link between individual performance and compensation (Alchian and Demsetz 1972; Holmstrom 1982). However, empirical accounting literature presents mixed results regarding the effect of individual versus group incentives on performance (see Honeywell-Johnson and Dickinson 1999). Some studies show that individuals perform better when they are paid with individual incentives (Prendergast 1999; Thurkow et al. 2000); others, that performance levels are approximately equivalent (Stoneman and Dickinson 1989). Consequently, more research is needed (Prendergast 1999; Honeywell-Johnson and Dickinson 1999).

### **Individualist-Collectivist Cognitive Orientation and Performance**

Not all people perceive incentives in the same way, and team members' personalities are one of the most crucial factors in determining team productivity and performance (Driskell et al. 1987; King and Anderson 1990). Individualism-collectivism theory distinguishes two major behavior types or tendencies in people (Chow et al. 2001; Ilies et al. 2007). Individualism refers to the

condition in which personal interests are accorded greater importance than are the needs of groups (Triandis and Gelfand 1998; Wagner 1995, 153). Individualists are independent, seeing themselves as separate and different from the team with which they are associated. In contrast, collectivists think of themselves as part of a team with which they feel associated (Kim et al. 1994; Wagner 1995). Collectivism is an orientation toward person-group relationships, in which such relationships are looked at as being far more permanent and central (Wagner 1995, 155; Eby and Dobbins 1997). Collectivistic orientation differs from traditional group attraction constructs, such as cohesiveness, in that collectivism is context-free (Eby and Dobbins 1997, 276) and, thus, the nature of the task and/or the incentive system does not invoke a more collectivist or individualist orientation (Wagner and Moch 1986; Eby and Dobbins 1997).

Because team members' cognitive orientation and motivation to work in a team vary, we should expect a continuum between the two types of teams, and we should expect differing teams to need different incentive systems (Ilies et al. 2007; Parker et al. 2009). When people do not want to work to benefit the team, they are usually competitive both with the rest of their team members and with other teams (Kim et al. 1994; Chow et al. 2001). People in such "individualist teams" place their individual objectives and goals above those of the team and do not have emotional relationships with their teammates, but rather sporadic relationships, usually linked with the work or task that they must carry out. This attitude can give rise to internal tensions and objective conflicts within the team that can impair performance (Finkelstein and Hambrick 1996; Wagner 1995).

In contrast, teams formed of people with a collectivist orientation have less internal competition, since their members are focused on cooperation and common work to benefit the team (Ilies et al. 2007). They have a strong collective interest, i.e., a team feeling that promotes team targets over individual interests (Tyler and Blader 2000), and can emphasize the needs of the team over their own individual needs when necessary to meet the team goals (Triandis and Gelfand 1998; Ilies et al. 2007). Also, it has been demonstrated that "social loafing" is significantly lower among collectivist team members than among individualists (Chen et al. 1998; Karau and Williams 1993).<sup>1</sup>

The foregoing arguments have two main implications for our study. First, teams formed by predominantly individualist people perform worse when the work requires interaction and cooperation between team members, because individualists are less cooperative than collectivists in team settings (Cox et al. 1991; Gundlach et al. 2006; Kirkman and Shapiro 2001). Second, teams with higher levels of collectivism cooperate more and perform better than teams with lower levels of collectivism (DeMatteo et al. 1998; Eby and Dobbins 1997; Wagner 1995), because they share responsibilities, collaborate more effectively, and share common goals (Earley and Gibson 1998; Sosik and Jung 2002). Consequently, we propose the following hypothesis:

**H1:** Team performance is higher for collectivist teams than for individualist teams.

Some researchers have argued that workers will accept and commit to team goals more easily when the incentive system is aligned with their cognitive orientation (Young and Selto 1991; Finkelstein and Hambrick 1996; Chenhall 2003). Analyzing this combined effect requires combining the economic and cognitive theoretical perspectives (Merchant et al. 2003). Few studies have analyzed the relationship between incentive schemes and cognitive orientation. Earley (1989), conducting a social loafing experiment with U.S. and Chinese management trainees, showed that Chinese people (a collectivist sample) performed better in a collectivist environment, while U.S. people (an individualist sample) performed better in an individualistic environment. Along similar lines, Kim et al. (1994) showed that individualists demand individualized incentives because they

<sup>1</sup> Social loafing refers to the finding that people do not try as hard when performing a task in which individuals' outputs are combined in such a way that individual contributions cannot be identified (Latané et al. 1979; Harkins and Szymanski 1989; Liden et al. 2004).

feel separate and different from the team. However, collectivists place a higher value on the accomplishments of the group than on individual performance, and prefer group goals and incentives (Kim et al. 1994). Erez and Somech (1996) argued that the best team performance should be obtained by collectivist teams with a group goal condition and group-based incentives. They argued that individualists prefer working alone, place individual goals above group goals, perceive little difference between ingroup and outgroup members and, therefore, compete with all other organizational members. As a result, individualists place more value on individual accomplishments and prefer incentives based on individual performance, whereas collectivists are more likely to prefer group-based incentive systems (Bento and Ferreira 1992).

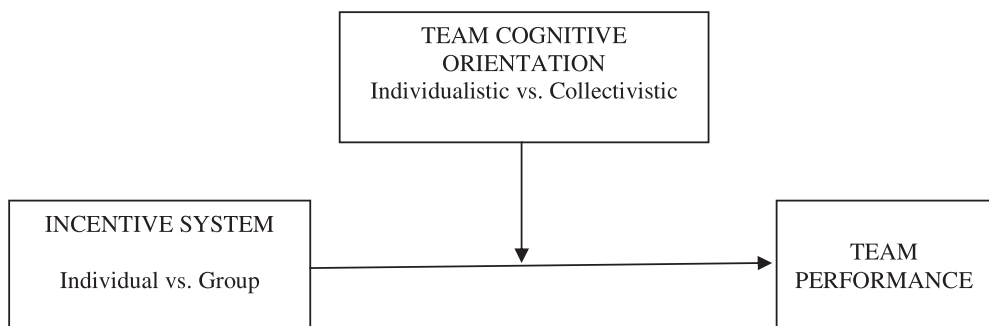
Since individualists tend to act for their own best interest, incentives should be designed so that their interest coincides with the best interest of the organization (Lere and Portz 2005). Organizations may want to set up individual incentives and hold individuals accountable for results. However, collectivists' tendency to act according to the best interest of the team implies it may be more effective for management to provide group-based incentives (Cable and Judge 1994; Ramamoorthy and Carroll 1998). Papamarcos et al. (2007) maintain that as long as the incentive system is aligned with the individualistic or collectivistic orientation of the workers, optimal productivity can be achieved.

In sum, the existing evidence suggests that team members with different cognitive orientations are motivated by different types of incentives. However, the combined effect of individualist-collectivist orientations and incentive schemes on performance has not been systematically examined. Incentive schemes and cognitive orientation of team members must fit well with each other because otherwise, frictions might prevent the team from performing optimally. We can expect an enhancing effect on performance when collectivist teams are rewarded by group-based incentives and individualist teams are rewarded by individual-based incentives. Thus, we formulate the following hypothesis:

- H2:** The relation between group and individual incentive structure and team performance will be moderated by the predominant cognitive orientation of the team, such that collectivist teams will perform better with group incentives and individualist teams will perform better with individual incentives.

The research model is depicted in Figure 1.

**FIGURE 1**  
**Research Model**



## METHOD

To analyze our hypotheses, we carried out a laboratory experiment with a  $2 \times 2$  design. The participants were postgraduate students from Pablo de Olavide University in Seville (Spain). Selecting students of all disciplines allowed us to avoid educational biases from their background. The independent variables were incentive (individual or group-based) and group's predominant cognitive orientation (individualist versus collectivist). The dependent variable was team performance. Before participating in the experiment, participants (184 students) took a test to identify their cognitive orientation. Using the multitrait-multimethod approach recommended by Triandis et al. (1998), this test combined three instruments to capture the multidimensionality of individualism and collectivism: social content, behavior content (Kim et al. 1994), and the Yamaguchi (1994) collectivism scale adaptation. Participants were asked questions such as: "Are you the kind of person who is likely take time off from work to visit an ailing friend," "You show resentment toward visitors who interrupt your work," "You stay with friends, rather than at a hotel, when you go to another town (even if you have plenty of money)," "You sacrifice self-interest for your parents," or "You avoid arguments with your parents, even when you strongly disagree with them." Questions were asked in a five-point Likert scale anchored at "1 = absolutely false" (I would never do this) through "5 = absolutely true" (I would always do this). Participants were told that they should answer the questions based on what they think they would actually do, not on what they think they should do.

Since the survey instruments had different ranges and measurement values, each instrument score was standardized by subtracting the grand mean for all participants from each individual participant's score and dividing this result by the standard deviation for all participants.<sup>2</sup> All individualist-collectivist standardized scores for each participant were summed, providing an overall score for each participant. Then, we classified participants into two categories falling above and below the median scores: individualists and collectivists.<sup>3</sup>

To evaluate the appropriateness of our coding, we performed a statistical discriminant analysis using the individual instrument z-scores as the independent variables and the original individualist-collectivist coding of participants as the dependent variable. The results showed that 98.20 percent of the original individualist-collectivist classifications were the same using cross-validated discriminant analysis.<sup>4</sup>

We then arranged with participants to meet us at the same time on a different day, but in four different classrooms, one per experimental condition. Participants were informed only of their assigned incentive contract, and were grouped randomly in teams of four members within each

<sup>2</sup> The grand mean was 3.19 and the standard deviation was 1.07. Participants' scores near the median were clearly different, which reduced the noise of having near-individualists classified as collectivists and *vice versa*.

<sup>3</sup> Participants' cognitive orientation was sample-specific, a fact that is not a problem since the focus of this paper is on differences in behavior as a result of the participants' relative individualism-collectivism orientation, and not on attempting to determine whether the participants were actually individualists or collectivists. Although this procedure has been cited by researchers on individualism-collectivism as the recommended procedure, a clear disadvantage is that the final participant individualist-collectivist scores are relative to the scores of the other participant scores. To date, research on cognitive orientation has not concentrated on the absolute classification of participants as individualists or collectivists, but only on the behavioral differences of participants based on their relative individualist-collectivistic orientation (see Triandis and Gelfand 1998; Chen and West 2008).

<sup>4</sup> Cross-validated discriminant analysis classification means that each participant's individualist-collectivist classification was determined by the discriminant function derived from the data on all other participants. This increases the validity of the discriminant classifications because the function used in classifying each participant is not biased by the data from that participant (Johnson and Wichern 1992, 547).



classroom. Each team was assigned to one of the four experimental conditions: Collectivist Orientation/Group Incentive, Collectivist Orientation/Individual Incentive, Individualist Orientation/Group Incentive, and Individualist Orientation/Individual Incentive. To avoid reactivity and experimenter effects, we showed a video with instructions to participants in every classroom. The instructional video was presented by a person who did not know the experiment objectives. To avoid any misunderstanding of the instructions, the same video was shown to participants twice.

The team task, which was very similar to other experimental production settings in the management accounting literature (Chow et al. 2001), simulated the assembly of an electronic plate with four different chips (represented with red, green, blue, and yellow stickers). Each participant was assigned a specialty in the assembly of one out of the four chips. Thus, each group had four members with different color specialties. The differently colored stickers had to be attached to base plates in specifically numbered places, in the same arrangement on each plate. Individual performance was measured by the correct attachment of stickers of the individual's assigned color (provided that the plate had four stickers),<sup>5</sup> but plate assembly counted toward the group's total number of completed plates (the dependent variable) only when all four colored stickers were attached correctly. Participants had 20 minutes to complete the task.<sup>6</sup>

Each sticker could be attached independently, but the final result was dependent on the correct attachment of all "chips." Thus, team members were free to organize their work in an independent way or to cooperate among themselves. This relatively easy task was chosen for two reasons. First, the task imposed interdependence, thus, free riding could not appear without affecting team performance. Second, the task's cognitive complexity was low, increasing the probability that the incentive would have positive effects on performance (Bonner et al. 2000). We paid participants and asked them not to comment on the experiment to others that might be participating in a later session. The individual reward was based on individual performance, and it was €0.50 to each person in the team based on placing the stickers of the right color on the plate. The group reward was based on team performance, and it was €2.00 per completed plate. We also offered four prizes of €300 distributed by lottery, with lottery tickets given out in proportion to productivity (in terms of completed plates as defined above).<sup>7</sup>

During the task, we noted some anecdotal differences between how collectivist teams organized their work as compared to individualist teams. Some individualist teams took some time discussing the leadership of the team, which led them to waste time and underperform.<sup>8</sup> We also noted that some collectivist teams executed the task more sequentially; that is, they focused on correctly finishing one plate before starting the next one. Some individualist teams created a pile of partially finished plates, as they concentrated on their own individual part of the task. We test for

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<sup>5</sup> Participants were shown that stickers should not touch the border of the circle (position on the plate) within which they were to be attached. The circle was drawn a bit bigger than the size of the sticker so as to require more attention from participants and slow the pace of production.

<sup>6</sup> The team task was designed to be as simple as possible, so no special skill was required. We asked in the post-experimental questionnaire about the participants' satisfaction with the task. Results show that the process was rated as enjoyable and interesting for most individuals (mean = 4.70, SD = 0.74).

<sup>7</sup> The objective for the raffle was twofold. The first objective was to attract enough participants to the experiment. The second objective was to encourage participants to do the task seriously and make every effort to provide quality responses during the experiment. The participation rate and the experimental task results show that the raffle played the role we intended.

<sup>8</sup> We counted three groups that wasted time talking. We removed these groups from our analyses, but results did not change.

**TABLE 1**  
**ANOVA Results**  
**Dependent Variable: Team Performance**

	Mean Square	df	F	Sig.
Incentive	9.735	1	5,295	0.026
Cognitive Orientation	17.443	1	9,487	0.004
Incentive $\times$ Cognitive Orientation	5.836	1	3,174	0.082
Error	1.839	42		

potential bias on team performance due to work organization differences between individualist and collectivist teams. We did not find any bias on team performance.<sup>9</sup>

## RESULTS

### Descriptive Statistics and Manipulation Checks

The average age of the participants was 21.78 years old. The majority were female (54.27 percent), and a plurality were business students (42 percent). Once participants had finished the task, they answered a post-experimental questionnaire designed to check manipulations of the variables (see Appendix A). To make sure that participants understood the incentive system, we asked them to agree or disagree, on a scale of 1 (totally disagree) to 5 (totally agree), with three different statements on a five-point Likert scale: (1) Compensation depends to a great extent on team results, (2) You are rewarded based on your individual result, and (3) Compensation depends on your own effort. A Cronbach's alpha of 0.81 for this scale indicates the scale is reliable (Nunnally 1978). The mean was 2.64 (SD = 0.67) in the individual reward condition ( $n = 23$ ), and 2.96 (SD = 0.56) in the group reward condition ( $n = 23$ ).<sup>10</sup> All this suggests that the incentive scheme manipulation design had the required effects.

Participants were also asked about performance of the task (Questions 8–12). They had to rate their agreement with various statements such as “I think that some team members did not do the best they could,” “I am satisfied with my own performance,” or “I am satisfied with the performance of the team members.” Responses from participants showed that when participants were rewarded on the basis of team performance, they were more satisfied with the performance of their team members, which provided corroborating evidence of the relationship between collectivist cognitive orientation and group-based incentive schemes.

<sup>9</sup> To test for potential bias on team performance due to the way the plates were produced, we ran independent-samples t-tests to test for differences between the performance mean scores between the collectivist teams who executed the task more sequentially (six teams) and those collectivist teams who did not (18 teams). We also compared differences between the mean scores between individualist teams who created a pile of partially finished plates (five teams) and those teams who did not (17 teams). The results show no difference between collectivist teams and individualist teams ( $t = 0.419$ ,  $p = 0.267$ , and  $t = 0.351$ ,  $p = 0.224$ , respectively). We also checked for differences of collectivist and individualist teams under individual and group incentive systems. The results of the t-tests show no differences.

<sup>10</sup> We also factor analyze the scale to ensure that the means were different in the individual versus group reward conditions. The scale had three items (Items 1–3; see Appendix A). Results show different means in every item for individual versus group reward conditions (Item 1: 1.18 versus 4.57, Item 2: 4.41 versus 1.79, and Item 3: 2.27 versus 2.61, respectively).



**TABLE 2**  
**Mean and Standard Deviation of Team Performances**

<b>Cognitive Orientation</b>	<b>Individual Incentive System</b>	<b>Group Incentive System</b>	<b>Overall</b>
Individualist	7.43	5.80	6.69
(standard deviation)	(1.27)	(1.93)	(1.77)
	n = 11	n = 11	n = 22
Collectivist	7.75	7.95	7.85
(standard deviation)	(1.21)	(0.92)	(1.06)
	n = 12	n = 12	n = 24
Overall	7.61	6.98	7.29
(standard error)	(1.23)	(1.12)	(1.54)
	n = 23	n = 23	n = 46

### Hypotheses Test

In order to test our hypotheses, we used a  $2 \times 2$  analysis of variance (ANOVA). Regarding our first hypothesis, which asserted that team performance is higher for collectivist teams than for individualist teams, Table 1 shows that cognitive orientation has a significant influence on team performance ( $p = 0.004$ ). In order to explain the significant effect, we carried out a mean variance analysis. Results in Table 2 support our hypothesis, showing that the average production by individualist teams was 6.69 (SD = 1.77) and by collectivist teams was 7.85 (SD = 1.06), the difference being significant ( $p < 0.01$ ). Furthermore, as agency theory predicts, results in Table 2 show that the productivity of teams is higher with individual incentives than with group incentives.

Our second hypothesis asserted that collectivist teams would perform better with group incentives than with individual incentives; in order to test it, we compared the average production of collectivist teams under different incentive systems. Results in Table 2 show that for collectivist teams, performance was higher with group-based incentives (mean = 7.95, SD = 0.92) than with individual incentives (mean = 7.75, SD = 1.21), but again, the mean difference was not significant. Our second hypothesis also asserted that individualist teams perform better with individual incentives than with group incentives; in order to test it, we compared the average production of individualist teams with different incentive systems. Results in Table 2 show that the performance of individualist teams was higher with individual incentives (mean = 7.43, SD = 1.27) than with group-based incentives (mean = 5.80, SD = 1.93), but the mean difference was not significant. Overall, we find a marginally significant ordinal interaction where individualist teams paid under group incentives performed worse, on average, than teams in any other condition.

To examine these results more deeply, we searched for differences in performance under individual incentives among individualist and collectivist teams. The results seem to show that such differences existed, but they were not significant. Under a group-based incentive, collectivist teams performed better than individualist teams (mean = 7.95 [SD = 0.92] and mean = 5.80 [SD = 1.93], respectively), but the mean difference was not significant. In opposition to our expectations, Table 2 shows that under an individual incentive, collectivist teams performed better than individualist teams (mean = 7.75 [SD = 1.21] and mean = 7.43 [SD = 1.27], respectively), but again, the mean difference was not significant.<sup>11</sup> Individualist teams with group-based incentives performed worse

<sup>11</sup> Although this paper is focused on team performance, we also collected data on individual performance under the individual incentive. We looked for differences between individual performance of collectivist teams and individualist teams, but results were not significant.

than any of the other three combinations. The results seem to indicate that individual incentives stimulate increased performance mainly in individualist teams. In a collectivist team setting, the intrinsic value of being a team member may motivate agents to adapt to team rules and norms, including the achievement of higher team performance. Collectivist behavior encourages team relationships, and the collectivist mentality accepts behavioral restrictions, perceiving rupture or frictions inside the team as a cost (Triandis and Gelfand 1998), and eliciting a higher team performance.

As a supplementary analysis, we test whether individual incentives worked just as well for individualist and collectivist teams. Further analysis of the *ex post* questions regarding team cognitive orientation<sup>12</sup> shows that the mean score in the Individualist Orientation/Group Incentive condition was 2.34 (SD = 0.55) in a scale range of 5, while the mean score in the Collectivist Orientation/Group Incentive condition was 3.96 (SD = 0.62). The mean score in the Individualist Orientation/Individual Incentive condition was 3.74 (SD = 0.59), while the mean score in the Collectivist Orientation/Individual Incentive condition was 2.27 (SD = 0.54). The differences between the mean scores were significant. Furthermore, the mean in the Individualist Orientation/Group Incentive condition was not significantly different from the means in the Individualist Orientation/Individual Incentive condition and the Collectivist Orientation/Individual Incentive condition. Furthermore, the mean in the Collectivist Orientation/Group Incentive condition did not differ significantly from the mean in the Individualist Orientation/Individual Incentive and the Collectivist Orientation/Individual Incentive conditions. We also tested whether individual goals could have been the predominant ones, even in collectivist teams. Answers to our *ex post* questions indicate a high mean score both for collectivist teams (mean = 3.79, SD = 0.59) and for individualist teams (mean = 4.20, SD = 0.83). However, there were no differences within collectivist by incentive condition. All these findings suggest that the teams with different cognitive orientations viewed the incentive structures differently, even though this did not seem to translate to performance.

Moreover, we tested whether participants identify with the team or feel like team members. Results of the analysis of *ex post* questions, such as “During the task, I paid attention to the efforts of my team members” (Q11) or “During the task, I considered myself part of this team” (Q6), show a mean score for collectivist team members of 3.18 (SD = 0.71), and for individualist team members of 2.74 (SD = 0.66). However, differences between the mean scores based on incentive system within collectivists and individualists were not significant by incentive condition.

## DISCUSSION AND CONCLUSIONS

Our empirical results partially support our hypotheses. In this paper, we show empirically that teams formed by members with a collectivist orientation reach higher performance than teams with a predominately individualist orientation, regardless of the incentive structure employed. Surprisingly, our findings indicate that incentive design variations have little effect on the performance of collectivist versus individualist teams. These results agree with previous studies that argued that collectivist team members can assume group goals as their own (Erez and Somech 1996; Triandis 1998), being centered on performance, regardless of incentive structures.

The lack of alignment between incentives design and cognitive orientation could also result from the type of task setting, which may not have encouraged enough cooperation among members

<sup>12</sup> We asked questions such as “During the task, I was mainly working for myself,” “I want to reach the team goals rather than my individual goals,” or “During the task, I paid attention to the efforts of my team members.” The analysis of the *ex post* questions shows that all the statements measured the same concept, with a Cronbach’s alpha of 0.78.

of the teams. Another type of production task, focused on innovative or creative activities, might be more appropriate for our research objectives. As Young et al. (1993) suggested, group incentives should improve performance only in situations where benefits might result from cooperation. Group incentives promote information sharing among team members (Fisher et al. 2008), and the productivity of the team could be positively affected by interaction among them (Che and Yoo 2001). Our experiment was limited to obtaining benefits from interaction. Although, like other experimenters, (Young et al. 1993; Libby and Thorne 2009) we simulated a factory setting, it was a traditional assembly line, where workers were not encouraged to assist one another physically. This condition was nominally cooperative, as final output depended on other team members' tasks and contributions, but interaction among members was not encouraged enough. While the task we designed for this study can be done without group interaction, it could require group interaction to be performed better and, thus, our results just show that one group performed better relative to the other group. These findings could be a reasonable starting point for future research lines. Furthermore, variables other than rational calculation of benefits might be mediating the relationship between incentive scheme and cognitive orientation, such as social identity of the team (Holmbeck 1997; Ellemers et al. 2004).

The results in this study highlight the importance of considering psychological factors, such as the nature of workers' cognitive orientation, when adopting performance-contingent pay. Thus, our findings can help to explain the confusing results that confront firms developing production systems based on cooperation and collaboration.

From a managerial point of view, one of the main implications of this research reinforces the importance of team design. Managers could use the results of this study to inform incentive design. Organizations with collectivist individuals appear to demand group-based incentives rather than individual incentives. It seems that the trend of using teamwork should be accompanied by an appropriate team design, distinguishing between group task designs and carefully considering how to reward the performance of the team (individual versus group incentives).

At the same time, our study has a number of limitations that may encourage future work. More research is required to determine whether the results of this study are reproducible, and the limits of their generality. In addition to the typical limitations of any single behavioral experiment (e.g., potential instrumentation effects and non-representative sampling), there is the problem of sample size. The lack of significance across individualist teams could be simply a function of sample power and, thus, future research could replicate the experiment with a bigger sample. Another major limitation of this study is the length of time students were exposed to the treatment conditions. This study uses newly formed groups, but in reality, people working in groups may have established relationships from previous interactions. A useful extension of this research would be to conduct a similar study over an extended period of time. Moreover, we considered psychological rather than social characteristics; future research could focus on social characteristics of the teams and their relationship with different incentive schemes.

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## APPENDIX A


### Post-Experimental Questionnaire


Participants were asked to answer the statements below in a scale range from 1 (Totally Disagree) to 5 (Totally Agree). We indicate the mean (standard deviation) for each item.

1. The compensation depends to a great extent on team results	2.87 (0.58)
2. I was rewarded based on my individual result	3.01 (0.64)
3. The compensation depends on my own effort	3.19 (0.66)
4. During the task, I was mainly working for myself	2.68 (0.57)
5. I want to reach the team goals rather than my individual goals	3.94 (0.67)
6. During the task, I considered myself part of this team	4.26 (0.72)
7. During the task, I considered the four persons a team	3.74 (0.65)
8. During the task, I did the best I could	4.01 (0.69)
9. I am satisfied with my own performance	4.12 (0.72)
10. I am satisfied with the performance of the team members	3.40 (0.64)
11. During the task, I paid attention to the efforts of my team members	3.04 (0.62)
12. I think that some team members did not do the best they could	2.89 (0.59)
13. I considered producing the pieces to be interesting	4.71 (0.76)
14. I thought producing the pieces was enjoyable	4.70 (0.74)
15. Choose the figure that more closely resembles your feelings toward the group while you were working on the tasks:	3.08 (0.64)

1                      2                      3                      4                      5

/-----/-----/-----/-----/-----/-----





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