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The Effect of Cognitive Moral Development on Honesty in Managerial Reporting

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Abstract This study examines whether truth-telling in the form of honest reporting is associated with cognitive moral development. Conventional agency theory assumes that people are self-interested and willing to tell a lie to increase their personal payoffs, while recent empirical evidence shows that some people give up monetary rewards to tell the truth (e.g., Evans et al., Account Rev 76:537–559, 2001). The social psychology literature suggests that cognitive moral development influences individuals' ethical decisions. We carried out an experiment whereby participants submitted managerial reports in which truth-telling decreased their monetary payoff. Despite the fact that their decisions were not subject to monitoring, auditing, or reputation effects, some participants reported honestly or partially honestly. We find the relationship between honest reporting and cognitive moral development to be both positive and linear. Compared with those at lower stages of cognitive moral development, participants at higher stages of cognitive moral development were more likely to submit an honest report and give up potential monetary gains from lying. We further examine the economic impact of honest reporting on the firm's profit. With the assumption of self-interest and profit maximization, Antle and Eppen (Manag Sci 31:163–174, 1985) suggest that a contract with a hurdle-rate feature reduces managers' information rent. We find that in comparison with the expected outcome of a hurdle contract, the firm can yield higher profits with a trust contract by hiring managers with a P-score higher than 16.67.

Motivation

The main purpose of our study is to examine the relationship between cognitive moral development (CMD) and honesty in reporting in an economic-choice experiment in which participants traded off honest reporting and their personal economic gain. Misreporting is one of the common frauds or economic crimes in business, which has led to several conspicuous business scandals caused by unethical managers (e.g., Enron, WorldCom, the subprime mortgage crisis, and General Motors' delayed recall in the USA). Finance, accounting, and management scholars have adopted the CMD model in the inquiry of business ethics issues in organizations and business; however, little research has examined the relationship between CMD and misreporting behavior.

Most of these studies examine the relationship between CMD and ethical intention and attitude (e.g., Arnold and Ponemon 1991; Eberhardt-Toth and Wasieleski 2013; Goolsby and Hunt 1992; Green and Weber 1997; Ponemon 1992; Ponemon and Gabhart 1990; Tsui and Gul 1996) and support a positive relationship between them. Based on Ajzen's (1991) theory of planned behavior that behavioral intention is a good predictor of actual behavior, these business ethics papers suggest that CMD has a positive influence on individuals' ethical choices. However, the results of a positive relationship between CMD and ethical intention and attitude may not be applicable to actual behavior because of the intention-action gap (Auger and

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Devinney 2007; Sheeran 2002; Webb and Sheeran 2004) and social desirability bias (Chung and Monroe 2003).

The empirical examination of the relationship between CMD and actual ethical behavior is important in building theory on ethical behavior, especially actual behavior that involves monetary gain (loss) (Blasi 1980; Fehr-Duda et al. 2006). A few business ethics studies examine the association between CMD and ethical actions (e.g., Bay and Greenberg 2001; Ponemon 1993). These studies apply an economic-choice experiment to examine the relationship between CMD and unethical behavior and find a non-linear relationship (Bay and Greenberg 2001; Ponemon 1993). The reasons for these counterintuitive findings may be due to the complexity of moral issues in the experimental tasks (as discussed below). Based on the four-stage model of moral behavior (Rest 1986, pp. 100–104), a moral agent recognizes the moral issue of a situation, then makes a moral judgment, establishes moral intent, and in the last stage engages in the moral action. Individuals with a higher level of CMD have a better moral judgment while they may not recognize the moral issue of the experimental situations (because of its complexity) as intended by the researchers. Hence, the empirical finding on the relationship between CMD and ethical behavior needs to be carefully reassessed before any conclusion about this relationship can be drawn.

To examine the relationship between CMD and honesty in managerial reporting, we adopted the budget reporting setting used in Evans et al. (2001) and conducted a multi-period economic-choice experiment. Several accounting studies have used a similar setting to examine honest reporting issues (e.g., Hannan et al. 2006; Rankin et al. 2008). The moral issue in our setting—overstating product costs to increase personal payoffs—is relatively straightforward; therefore, individuals do not need to have a high level of moral sensitivity in order to make an ethical judgment and implement their ethical action.

Undergraduate students were recruited from a large North American university; these students had completed one finance course and at least three accounting courses, including one in managerial accounting. Participants were asked to assume the role of manager and submit production budgets to headquarters to obtain funds for production. The participants were told that the cost information was provided to the manager only, the cost information was error-free, they would be neither monitored nor audited, and there would be no reputational effect. Based on the cost information, participants decided whether they misreported production costs to gain excess funds as their person gains or submitted an honest report to headquarters even though headquarters did not know the true production cost. After submitting production cost budgets for nine periods, participants were asked to complete the Defining Issues Test (DIT) (Rest 1979, 1986), which measured their CMD.

Consistent with Evans et al. (2001), our results show the existence of dishonest, honest, and partially honest participants, even in the absence of monitoring, auditing, and reputation effects. We find a positive correlation between honesty in reporting and the DIT's P-score,[1] and between the honesty index and the N2-score,[2] which suggests that individuals with a higher level of CMD are more likely to report honestly. Our findings suggest that DIT, which measures individuals' moral judgment, affects their actual budget reporting behavior. We test a quadratic relationship between participants' CMD and their honesty in reporting and find a linear association.

With the evidence of a positive and linear relationship between CMD and honest reporting, we further examine how managers with a different level of CMD affect a firm's profit. Based on the assumption of self-interest and profit maximization, Antle and Eppen (1985) suggest a contract with a hurdle-rate feature to improve the firm's profit and reduce managers' information rent. We find that in comparison with the firm's profit under a hurdle-rate contract, a trust contract can yield more firm profit when firms hire managers with a P-score higher than 16.67. This result suggests that firms may design different contracts for managers with different levels of moral development in order to achieve optimal outcomes.

Our study contributes to the business ethics literature in the following ways: First, we provide empirical evidence on a positive and linear relationship between CMD and honest reporting when such ethical behavior affects individuals' personal payoffs. Participants make economic choices during their budget submission. With the results of a non-linear relationship between CMD and ethical actions, Ponemon (1993) calls for more research on the relationship between CMD and economic-choice actions. Our findings fill the gap between CMD theory and economic choices because without more empirical evidence, we are unable to understand whether and how CMD influences individuals' budget reporting.

Second, recent economic theorists revise the assumption of self-interest and incorporate the preference for honesty in formulating optimal incentive schemes (Alger and Renault 2006, 2007; Fischer and Huddart 2008; Mittendorf 2006). These academics call for future research into factors that explain managers' reporting behavior and into how compensation contracts can be redesigned to incorporate these factors (Evans et al. 2001). The comparisons between

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[1] Post-conventional P-score refers to the post-conventional stage in CMD; that is, it measures "the relative importance a subject gives to principled considerations in making an ethical decision" (Rest et al. 1997, p. 498).

[2] N2-score is a measure of prioritizing the high stages of CMD (similar to the P-score) and of discriminating or rejecting the lower stages (Rest et al. 1997, p. 500).

a firm's profit with managers with different levels of CMD and the profit with a hurdle-rate contract suggest that the optimal contract based on the self-interest assumption does not yield a better outcome than a trust contract with a high-CMD individual. This analysis also highlights the importance of incorporating ethical preferences in studying the optimal contract issue.

Third, the results of the positive association between honest reporting and CMD provide implications for firms in the designing of managerial reward schemes and in the hiring and training of managers. As individuals with higher levels of CMD (compared with lower) reported more honestly, firms may exploit this knowledge to screen and train managers in the hiring and retention process and to design compensation schemes according to their managers' level of CMD. For example, when hiring managers with high levels of CMD, firms may apply a trust contract without setting any hurdle. When firms hire managers with low levels of CMD, firms may combine ethical education and other social conditions, such as public disclosure, to motivate managers' honest reporting (Mayhew and Murphy 2009).

Literature Review and Hypothesis Development

Cognitive Moral Development

The social psychology literature suggests that a critical personal characteristic, CMD, influences an individual's ethical decision-making process. To illustrate how an individual makes decisions when faced with an ethical dilemma, Kohlberg (1968, 1969, 1976) proposes a moral development model to theorize the cognitive aspect of moral decision making. His CMD model contains three levels, with each level embedding two stages. At Stages 1 and 2 (the preconvention level), an individual is concerned with consequences, especially punishment and immediate interests. Employees at this level of moral development are concerned only for themselves (Roberts and Wasieleski 2012). For example, employees evaluate the employer's treatment of them through personal interest so that actions taken for the common good are evaluated negatively if these actions do not benefit them or if these actions have a perceived negative impact on them (Roberts and Wasieleski 2012). Further, when these actions are perceived to have a negative impact on them, these employees will act unethically for their own advantage (Roberts and Wasieleski 2012).

At Stages 3 and 4 (the conventional level), an individual conforms to the expectations of good behavior of the family, peer group, and society. That is, at the conventional level, when making (an) ethical decision(s), an individual

is motivated to fulfill the expectations of significant others or to follow the perspective of society. Employees at this level of CMD are likely to look to their peers for support when making ethical decisions. They are also likely to comply with rules and regulations. As the CMD of most adults in industrialized nations is at the conventional level (Kohlberg 1969; Rest 1986; Rest et al. 1999), employees with this level of reasoning are likely to look to the people around them for moral and ethical guidance. Thus, these individuals are inclined to follow the moral influence of others as well as comply with societal laws. This makes them receptive to training, and management can make use of this knowledge to provide training in ethics and to hire ethical employees who could be a positive influence on their colleagues.

At Stages 5 and 6 (the post-conventional level), individuals make ethical decisions that are determined by universal values rather than self-interest. They are more likely to consider the greater good of society in their decision making, have greater respect for human rights and justice for all, and use universal moral values to maintain social order (Roberts and Wasieleski 2012). In the workplace, employees at this level of moral reasoning will view the employer's actions as morally defensible if they serve the collective good (Roberts and Wasieleski 2012).

From Kohlberg's (1969) six stages of moral judgment, Rest (1979, 1986) developed the DIT to measure the level of individuals' moral development and the reasons behind their moral decisions. The DIT presents a series of scenarios and offers the test-taker solutions based on different cognitive schemes. The scenarios and responses represent the fundamental underlying structure of social thoughts instead of detailed descriptions of specific concepts and ideas (Rest, 1986). The DIT produces a number of component scores to reflect test-takers' cognitive schemes, including the Personal Interest score, which represents the proportion of test items selected under Stages 2 and 3 considerations; the Maintaining Norms score, which reflects the proportion of test items selected under Stage 4 considerations; and the post-conventional score (i.e., P-score), which reflects test-takers' Stages 5 and 6 consideration. The DIT also calculates an N2-score, which includes two parts: a measure of prioritizing the high stages of cognitive development and a measure of discriminating or rejecting the lower stages (see below) (Rest et al. 1997).

Cognitive Moral Development in the Business Ethics Literature

With the use of the DIT to measure CMD, business ethics literature examines the relationship between CMD and ethical intentions and attitudes (e.g., Arnold and Ponemon 1991; Eberhardt-Toth and Wasieleski 2013; Goolsby and

Hunt 1992; Green and Weber 1997; Ponemon 1992; Ponemon and Gabhart 1990; Tsui and Gul 1996). These studies conclude that CMD is positively correlated with ethical intentions. For example, financial managers with higher levels of CMD have higher intentions to make sustainable business decisions (Eberhardt-Toth and Wasieleski 2013). Auditors with low DIT scores are more likely to have intentions to underreport audit time relative to auditors with high DIT scores (Ponemon 1992). Furthermore, auditors with high DIT scores are more likely to take whistle-blowing actions and resolve independence conflicts relative to auditors with low DIT scores (Arnold and Ponemon 1991; Ponemon and Gabhart 1990; Tsui and Gul 1996). Accounting seniors' level of ethical development is positively associated with the choice of ethical actions (Green and Weber 1997).

Intention is defined "as a person's location on a subjective probability dimension involving a relation between himself and some action. A behavioral intention refers to a person's subjective probability that he will perform some behavior" (Fishbein and Ajzen 1975, 288); hence, intention is the best predictor of behavior. Ajzen's (1991) theory of planned behavior suggests that people tend to act in a manner consistent with their intention. The likelihood of taking the action is known to be a reliable measure of whether respondents would actually take a similar action in a similar scenario. Therefore, based on the theory of planned behavior, the findings of a positive association between CMD and self-reported ethical intentions implied that CMD has a positive influence on ethical behavior.

However, at least a third of variance is observed between intentions and behavior (Sheeran 2002; Webb and Sheeran 2004). With such a big variance, the gap between intention and behavior is not negligible (Sheeran 2002); hence, ethical intentions may not lead to ethical actions. For example, Auger and Devinney (2007) find that ethically minded consumers rarely purchase ethical products. In a related area, ethical intentions are subject to a social desirability bias; that is, people have a tendency to underestimate (overestimate) the likelihood they would perform an undesirable (desirable) action (Chung and Monroe 2003). In sum, the intention-behavior gap and social desirability bias suggest that ethical intentions may be poor predictors of ethical actions, and the findings of a positive association between CMD and ethical intentions may not determine the relationship between CMD and ethical behavior.

Because of the difficulty in measuring actual (un)ethical behavior, few business studies have empirically examined the relationship between CMD and actual ethical behavior. The studies that have done so (e.g., Bay and Greenberg 2001; Ponemon 1993) show an inverted-U-shaped relationship between CMD and ethical behavior, which is

counterintuitive. For example, Ponemon (1993) applied an economic-choice experiment based on the Prisoner Dilemma scenario (which involved free-riding actions) to examine the effect of CMD on students' ethical behavior. Specifically, students were told that because of budget cuts at their university, they were asked to submit payment for class handouts. Students were told that if the university did not recover the handout expenses from students' payments, the university would ask students to pay more next semester. Ponemon (1993) finds that students with high and low P-scores paid less than the expected amount. In contrast, students with the medium range of P-scores acted more ethically and paid more. Bay and Greenberg (2001) also report an inverted-U-shaped relationship between the P-score and unethical actions. They used an economic-choice experiment that involved buyer–seller transactions: participants (sellers) were able to increase their sales by lying to their colleagues (buyers).

The moral issues in Ponemon (1993) and Bay and Greenberg (2001) are relatively complicated so that participants may not recognize the moral issues involved; this recognition failure was reflected in their moral insensitivity in these experimental settings. Rest (1986, pp. 100–104) proposes a four-stage model of moral behavior, theorizing an individual's ethical decision-making process and the relationship between moral judgment and moral actions: a moral agent recognizes the moral issue of a situation (Stage 1-moral sensitivity), makes a moral judgment (Stage 2-moral judgment), establishes moral intent (Stage 3-moral motivation), and, in the last stage, he or she engages in the moral action (Stage 4-moral action). Hence, the participants may have a higher level of CMD and a better moral judgment but they may not recognize the moral issue of the experimental situations as intended by the researchers.

Specifically, Ponemon (1993) recorded the amount that students paid for course handouts to measure ethical behavior; that is, the students who did not pay the full amount were construed to be engaging in free-riding behavior. However, some students with high P-scores may think they had paid their tuition in full and this should cover their handout costs. If they did not think that they should be responsible for the additional costs, they would disagree that not paying extra was "free-rider" or unethical behavior. Particularly, participants with high levels of CMD have greater respect for human rights and justice for all, and use universal moral values to maintain social order when making their own ethical decisions. If they thought it was justifiable to have the university pay for the handouts, not paying extra was reflected in their decision but such a decision was labeled as unethical by the researcher.

In Bay and Greenberg (2001), sellers were given two types of cards (high quality/value and low quality/value) with different combinations. Sellers were instructed to sell

as many cards as possible to two types of buyers: high-quality and low-quality. Compensation to sellers is based on a bonus if the sales goal was achieved. Since sellers would like to sell more cards to achieve their goal, they could lie to their colleagues (buyers) and sell low-quality cards to high-quality buyers and high-quality cards to low-buyers.[3] Both types of transactions were treated as unethical behavior; however, participants might not think that selling high-quality cards to low-quality buyers was unethical since selling high-quality goods follows universal values.[4] Moreover, they may think that selling high-quality cards to low-quality buyers was a discount. The complicated moral issues in these two studies may reduce participants' moral sensitivity and lead to the inverted-U-shaped relationship between CMD and ethical actions.

Cognitive Moral Development and Honest Reporting

Our main research question is to examine the relationship between CMD and honesty in managerial reporting. In decentralized firms, managers prepare budgets and financial reports and communicate valuable local information to their superiors (or the firm) to assist in operating, marketing, and investing decisions. Managers are required to disclose all relevant information to the employer, as concealing relevant information from the firm is unethical (CPA, Ontario 2011). However, conventional agency theory of self-interest states that an agent "is assumed to be effort-averse and morally insensitive" (Stevens and Thevaranjan 2010, p. 125). That is, managers report their local information opportunistically when such opportunistic reporting increases their benefits. The assumption of self-interest proposes that people deceive others if the benefits outweigh the risks associated with the deceptive behavior (Stevens and Thevaranjan 2010; Baiman and Lewis 1989). Baiman and Lewis (1989) reaffirm the validity of this self-interest assumption and provide experimental evidence that shows that individuals require only a very small monetary incentive (USD .25) to report opportunistically.

Subsequent economics and business research, however, challenges this assumption and provides empirical evidence to show honesty in reporting (Evans et al. 2001; Gneezy 2005; Nagin et al. 2002). For example, Evans et al.

(2001) show that when individuals were given the opportunity to lie for a greater payoff in the absence of monitoring, auditing, and reputation effects, they gave up as much as 42.9–48.7 % of the available payoff by reporting either honestly or partially honestly. Gneezy (2005) finds that 48 % of his participants chose to tell the truth and give up a potential gain from lying of USD 10. Nagin et al. (2002) observe that honest employees are not inclined toward opportunism even when the firm reduces monitoring. These findings suggest that, in reality, some individuals tend to be honest and do not deceive for personal gain while some others tend to be dishonest and will deceive for personal gain.

These empirical findings—that a certain percentage of individuals are honest—are consistent with Kohlberg's (1969) theory of moral development that individuals with a high (relative to those with a low) level of moral development are expected to act more ethically. Hence, based on Kohlberg's (1969) theory of moral development, our first hypothesis is as follows:

H1 There is a positive relationship between participants' CMD and honest managerial reporting

This hypothesis is consistent with prior literature on the relationship between CMD and ethical intention (e.g., Arnold and Ponemon 1991; Eberhardt-Toth and Wasieleski 2013; Goolsby and Hunt 1992). Next, we examine whether there is a linear relationship between CMD and honest reporting. Although non-linear relationships between CMD and ethical actions are reported in business literature (Bay and Greenberg 2001; Ponemon 1993), the complex moral issues in these experimental settings may explain the counterintuitive results. In our study, we make use of a task that involves honest reporting that is high moral-sensitive and involves no complex moral issues. Therefore, we expect a linear relationship between CMD and honest reporting. Hence, we hypothesize as follows:

H2 There is a linear relationship between participants' CMD and honest managerial reporting.

Conventional economics literature examines the issue of a firm's misallocation of resources due to information asymmetry between the firm and self-interested managers. To minimize the agency cost due to managers' misreporting, economics researchers propose models of optimal contracts to improve the efficiency in resource allocation. However, these optimal contract models often achieve the second-best outcome in comparison with the first-best outcome, where managers fully disclose their private information. Optimal contract models in economic literature ignore the fact that some managers have higher moral developments. If our hypotheses of a positive and linear relationship between CMD and honest reporting is

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[3] Sellers were paid based on their sales and also a bonus when sales goals were achieved. The sales goals varied based on the number of high-quality and low-quality cards given to the sellers. Bay and Greenberg (2001) did not provide information about sellers' goal and the distribution of cards given to each sellers.

[4] Buyers were compensated based on the number of cards purchased. However, it was unclear whether sellers knew that buyers were paid based on the number of correct types of cards or based on the value of the cards.

supported, does a trust contract used in a firm with information asymmetry achieve the same or a better outcome when the firm hires managers with a higher level of CMD in comparison with the outcome of an optimal contract based on the assumption of self-interest and profit maximization? To answer this research question, we apply the optimal contract formulated by Antle and Eppen (1985) and Antle and Fellingham (1995) as a benchmark. The proposed optimal contract is to include a production hurdle—that is, when managers submit a budget in excess of the hurdle rate, no production is funded. The hurdle contract serves as a good benchmark since our experiment setting is similar to this theoretical setting. We examine the difference in the economic outcome of an optimal contract and that of a trust contract for managers with different levels of CMD. We compare the profit of a firm with managers at a high, middle, and low level of CMD with the benchmark. Our research questions are as follows:

Q1 Does a trust contact achieve a better outcome for a firm that employs a high-CMD-level manager compared with the outcome of an optimal hurdle contract?

Q2 Does a trust contact achieve a better outcome for a firm that employs a middle-CMD-level manager compared with the outcome of an optimal hurdle contract?

Methodology

We carried out an economic experiment with multi-period games using computer simulations. We recruited undergraduate students from a large North American university; the students had completed one finance course and three accounting courses, including one in managerial accounting. Our experiment did not require the participants to have any specialized knowledge to perform the assigned tasks; hence, the issue of whether results that are based on student participants are generalizable to the broader population is less crucial (Peecher and Solomon 2001; Swieringa and Weick 1982). Prior research that adopted similar experimental settings also used student participants (Evans et al. 2001; Hannan et al. 2006; Rankin et al. 2008).

The experimental instrument was adapted from Evans et al. (2001). Participants were asked to assume the role of division manager. The task required participants to submit their cost budget to headquarters to obtain funds for the production of the 1000 units of a product that, if funded, would yield revenues of 6500 lira in each period.[5] Headquarters funded the production on the basis of the

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[5] Lira is used as experimental money.

participants' report and paid them 250 lira per period. Participants were provided with the product cost information before submitting the budget. They were told that the information was correct and without error. They were also told that while headquarters knew the distribution of product costs, it had no knowledge of the actual product costs. Hence, in practice, participants could submit a budget that was more than the actual cost and keep any overstated costs as their personal gains. Participants could also decide to forgo economic interest and submit an honest report.

The actual production cost of between 4 and 6 lira per unit was randomly chosen from a set of 21 possible costs (i.e., 4.0, 4.1, 4.2,…, 6.0). We provided participants with several examples to illustrate how managers' earnings and their division's contribution to the firm's profit might vary under the different budgets submitted. Participants were given a spreadsheet that listed personal earnings and their division's contribution to the firm's profit under all possible combinations of actual cost and submitted budget. After the instructions were read out, participants were allowed to ask questions. Three trial periods were run to familiarize them with the budget submission process via the computer.

The experiment consisted of nine periods of which participants did not have prior knowledge. The actual costs were randomly assigned by the system. Before the experiment, each participant was given a confidential identification number to log into the system. At the beginning of each period, the computer showed participants information of the actual cost. After submitting their budget, participants were provided with information about the amount of corporate funding for production and their personal earnings from the current period, which included their salary and the surplus from the corporate funding if they overstated the production costs. Information about their cumulative earnings and their contribution to the firm's profit was also provided. The cost information for the next period was given once all participants had completed their budget submission. After nine periods, participants were asked to complete post-experiment questions.

Participants were paid cash based on their cumulative earnings. This cash was converted to Canadian dollars at the exchange rate of 200 lira per dollar. While participants were answering the post-experiment survey, an independent research assistant was preparing the payment in the payment room. The research assistant did not know the purpose of the experiment. At the end of the experiment, participants entered the payment room individually and used their confidential identification number to claim their payment from the research assistant.

We examine the correlation between honesty in managerial reporting and CMD in an attempt to understand the motivation behind honest and dishonest reporting. Several tests are available to measure CMD. We chose the DIT

Table 1 Descriptive statistics

	Complete sample (N = 26 men, 31 women)		1st session of experiment (N = 25; 11 men, 14 women)				2nd session of experiment (N = 32; 14 men, 17 women)				T test
	Mean	SD	Mean	SD	Minimum	Maximum	Mean	SD	Minimum	Maximum	
Age	20.8	1.5	20.7	2.2	19.0	29.0	20.9	0.4	20.0	22.0	−1.12
Importance of personal earnings[a]	4.0	2.3	3.6	2.1	1.0	7.0	4.3	2.5	1.0	7.0	−3.23***
DIT type indicator	4.4	2.2	4.3	2.3	2.0	7.0	4.5	2.1	1.0	7.0	−0.94
Post-conventional P-score	31.2	16.0	26.0	15.1	3.3	53.3	35.2	15.7	0.0	63.3	−6.82***
Maintain norms (Stage 4)	32.3	13.3	24.9	8.4	13.3	46.7	38.1	13.7	3.33	73.3	−12.93***
Personal interest (Stage 2/3)	24.1	14.9	29.1	10.8	10.0	50.0	20.2	16.6	24.1	56.7	7.03***
N2-score	33.2	14.9	29.3	13.3	7.9	58.0	36.3	15.5	−4.4	64.2	−5.41***

[a] Participants responded to the following question: How important are your personal earnings in determining your budget? (1 not important at all, 7 very important)

*, **, *** significance at 10, 5, 1 % two tailed, respectively

(Rest 1979, 1986), first, because of its wide acceptance in business studies (e.g., Eberhardt-Toth and Wasieleski 2013) and, second, because of the ease of administering it both in a study situation and in hiring and training settings.

We contacted participants via email 6 months later to complete the DIT scale because we did not want participants to link the DIT survey with the main experiment. To increase the response rate, we provide CAD 20 for completion of DIT. However, only 25 of the initial 45 students completed the DIT.

Due to the poor response rate, we repeated our experiment and recruited 32 students. Because the response rate for the DIT questionnaire in our first session was only 55 %, to avoid non-response bias, we modified our design and asked participants to complete the budget submission and DIT questionnaire in the same session, following prior literature (e.g., Ponemon and Gabhart 1990). After the budget submission, we asked participants to provide their judgments and decisions on the DIT cases. To prevent participants from rushing the DIT survey, we told participants that we provide CAD 5 to participants who correctly answer a quiz question at the end of DIT questions and that the quiz question is related to the DIT cases but not to their judgment.

The final sample includes 57 participants (26 men and 31 women). Table 1, shows the means (SDs) of the DIT component scores of the complete sample: P-score 31.2 (16.0), Maintaining Norms score 32.3 (13.3), the Personal Interest score 24.1 (14.9), and N2-scores 33.2 (14.9). In comparing these two groups of students, Table 1, shows that the participants in the 1st session of the experiment have lower P-score, N2-score, and Maintaining Norms score (Stage 4) and higher Personal Interest score (Stage

2/3). The average of DIT component scores of the second session is similar to that of the prior literature (e.g., Bay and Greenberg 2001).

In observing the significant differences in the DIT component scores between the participants in two sessions, we analyze the response bias of the participants of the 1st session of experiment. We compare participants who returned to complete the DIT questionnaire with those who did not; we find that the students who returned to answer the DIT questionnaire have a lower weighted average honesty index (.33 vs. .58). We find that the students who returned to answer the DIT questionnaire have a lower level of weighted average honesty index. These students are more likely to submit dishonest report; hence, they have lower P-score, N2-score, and score of Maintaining Norms compared to those in the 2nd session (Table 2).[6]

Results

Honest Reporting

Following Evans et al. (2001), we measured participants' ethical behavior by the level of honesty in their reporting; we calculate an honesty index, which equals 1 − payoff claim/payoff available in each period. For example, if the participant submitted a budget of 5 lira per unit for

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[6] Although collecting DIT data after 6 months of the 1st session experiment prevents subjects from linking the budget submission experiment with the DIT, we may obtain a biased sample with a lower level of CMD.

Table 2 Comparison of returning-DIT students and non-returning-DIT students from the 1st session of experiment

	Returning-DIT students ($N = 25$; 11 men, 14 women)				Non-returning-DIT students ($N = 20$; 6 men, 14 women)				T test
	Mean	SD	Minimum	Maximum	Mean	SD	Minimum	Maximum	
Age	20.7	2.2	19	29	20.8	0.7	19	22	0.02
Weighted average honesty index[a]	0.3	0.3	0	1	0.6	0.3	0	1	−2.9***
Importance of personal earnings[b]	3.6	2.1	1	7	3.2	1.8	1	6	0.7

[a] The weighted honesty index is calculated as $1 - \left(\Sigma_{p=1}^{9} \text{ payoff claimed}_p \Big/ \Sigma_{p=1}^{9} \text{ payoff available}_p \right)$

[b] Participants responded to the following question: How would you rate the difficulty of budget reporting task? (1 not difficult at all, 7 very difficult)

*, **, *** significance at 10, 5, 1 % two tailed, respectively

production when the actual cost was 4.5 lira, then the participant's honesty index for this period was .33 $(1 - (6.00 - 5.00)/(6.00 - 4.50))$.

Twelve participants (21 %) were completely dishonest; they submitted a budget of 6 lira per unit (the maximum possible cost) over the nine periods to maximize their personal payoffs. Six participants (11 %) were completely honest. Partially honest participants [39 (68 %)] reported honestly in some periods (Table 3). The range of participants' payoffs (i.e., funding received plus salary less cost of production) for the nine periods was between CAD11.25 and CAD65.25, with a mean of CAD40.94 (SD CAD16.69). By providing honest or partially honest reports, participants gave up a maximum of CAD54 and a mean of CAD24.31. Table 4 shows the honesty index for each of the nine periods. For each period, participants reported dishonestly, honestly, and partially honestly; the mean (SD) of honesty index ranged between .36 and .42 (.40–.43) (Table 4).[7] These results are consistent with Evans et al. (2001) and suggest that some individuals do report honestly and give up an opportunity to lie for personal gain even when there is no possibility of their behavior being detected or their identity being discovered.

Hypotheses Testing—the Association Between CMD and Honest Reporting

To test H1, we examine the relationship between the level of CMD and honest reporting. We collected information on participants' age and gender. Correlations were performed between these demographic variables and the honesty index dependent variable. Neither age nor gender was significantly correlated with the dependent variable; thus, we omit them from our regression analyses. In the post-experiment questionnaire, participants responded to a

question that asked how important personal earnings in the experiment were to them (1 not important at all, 7 very important). Empirical evidence shows that the love of money is positively associated with unethical behavior because the love of money motivates people to do whatever it takes to make money (Tang and Chiu 2003); hence, we include the measure of the importance of personal gain as a control variable. Furthermore, in our study, the level of honesty in reporting affects participants' payoff; participants' love of money drives them to overstate the cost report. To avoid performing multiple tests on the same data set, we pooled the data of the nine periods to yield a single data set with 513 observations (57 participants × 9 periods) and ran a repeated measures regression model.

First, we analyze the relationship between the P-score and honesty index. Recall that the P-score measures how principled a participant is when making an ethical decision. The DIT also measures two other aspects of principled development. The Personal Interest Schema Score sums the proportion of items from Stage 2 and Stage 3 that appeal to the respondent, while the Maintaining Norms Schema Score represents the proportion of items selected from Stage 4. The Post-conventional Schema Score (i.e., the P-score) represents the proportion of items selected from Stage 5 and Stage 6. The P-score sums and converts to a percentage the scores from Stage 5 and Stage 6. Therefore, it represents the respondent's preference for Post-conventional thinking compared to Personal Interest and Maintaining Norms thinking. Because CMD is developmental, the Personal Interest Schema and Maintaining Norms Schema are transitional (Rest et al. 1999). Therefore, the scores that capture these two schemata are seldom used in academic research.

Table 5 show the result of the effect of CMD on the honesty index. Table 5, Panel A, shows that the P-score is positively related to the honesty index, suggesting that participants with higher CMD submitted more honest managerial reports ($t = 6.08$, $p < .0001$). Thus, H1 is

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[7] We apply an ANOVA model to test the period effect and find an insignificant effect of period on honesty index.

Table 3 Percentage of honesty, payoff forgone, and report types

Weighted average honesty index[a]	37.9 %
Payoff forgone of nine periods[b]	
Mean ($)	$24.31
Maximum ($)	$54
Report types[c]	
Economic (honesty index = 0 %)	$n = 12\ (21\ \%)$
Partially honest (0 % < honesty index < 100 %)	$n = 39\ (68\ \%)$
Honest (honesty index = 100 %)	$n = 6\ (11\ \%)$

[a] The weighted average honesty index is calculated as $1-\left(\Sigma_{p=1}^{9}\ \text{payoff claimed}_p\ /\ \Sigma_{p=1}^{9}\ \text{payoff available}_p\right)$; that is, 1 minus the ratio of payoff claimed for all periods divided by payoff available

[b] Payoff forgone is the amount of additional profit that the participant could have received by lying to the maximum (i.e., the difference between the payoff available and the payoff claimed)

[c] Each participant is categorized as economic, partial honest, or honest based on the weighted average of honesty index

Table 4 Honesty index for each period

	Minimum	Maximum	Mean	SD
Period 1	.00 ($n = 24$)	1.00 ($n = 13$)	.37	.43
Period 2	.00 ($n = 25$)	1.00 ($n = 14$)	.38	.41
Period 3	.00 ($n = 23$)	1.00 ($n = 11$)	.36	.40
Period 4	.00 ($n = 27$)	1.00 ($n = 14$)	.38	.40
Period 5	.00 ($n = 22$)	1.00 ($n = 11$)	.39	.40
Period 6	.00 ($n = 29$)	1.00 ($n = 16$)	.37	.44
Period 7	.00 ($n = 21$)	1.00 ($n = 9$)	.39	.39
Period 8	.00 ($n = 22$)	1.00 ($n = 14$)	.42	.41
Period 9	.00 ($n = 24$)	1.00 ($n = 8$)	.38	.39

Total sample size is 57. The honesty index is calculated as $1-(\text{payoff claimed}_i / \text{payoff available}_i)$

supported. The honesty index is negatively related to the importance of personal earnings measure ($t = -12.78$, $p < .0001$). This finding is consistent with Tang and Chiu (2003), who found a direct relationship between the love of money and unethical behavior. Our results show that participants for whom personal earnings were more important are more likely to provide dishonest reports compared with those for whom personal earnings were less important.

Further to the P-score, recently, a more valid and reliable index is introduced—the N2-score (Rest et al. 1997). The N2-score is computationally more complex because it includes the P-score and the standardized difference and average ratings between the Personal Interest and the Post-conventional statements (Rest et al. 1997). It is designed to measure the extent to which an individual has attained a more sophisticated level of moral thinking and has also

gained clarity about ideas that are simplistic and biased (Rest et al. 1997). Consequently, it represents the extent to which Post-conventional items are prioritized and the degree to which Personal Interest items receive lower ratings relative to the ratings given to Post-conventional items (Rest et al. 1997). Further, the internal consistency of the N2-score (as measured by the Cronbach's alpha index) is higher (Rest et al. 1999).[8]

To provide further support for H1, we analyze the relationship between the N2-score and the honesty index. The results are shown in Table 5, Panel B. The N2-score has a positive relationship with the honesty index, suggesting that participants at higher stages of CMD reported more honestly relative to participants at lower stages of CMD ($t = 5.87$, $p < .0001$). This result also supports H1. Similar to the results of P-score, the importance of personal earnings measure is negatively associated with the honesty index ($t = -11.82$, $p < .0001$).

To test H2, we examine whether participants with a high level of CMD made more unethical actions than those with a mid-level of CMD, since both Bay and Greenberg (2001) and Ponemon (1993) find a quadratic relationship between CMD and ethical behavior. We also estimate a quadratic model. We found that the coefficient on the quadratic term of the P-score and N2-score is insignificant (Table 6), which suggests no quadratic relationship between CMD and honest reporting. Hence, H2 is supported.

Research Questions—the Effect of Managers' CMD on Corporate Earnings

Based on the assumption of self-interest and profit maximization, Antle and Eppen (1985) and Antle and Fellingham (1995) formulate a model of an optimal contract and suggest setting a production hurdle in the contract—that is, when managers submit a budget in excess of the hurdle rate, no production is funded. With a hurdle contract, the firm can reduce managers' slack due to overstating their budget, while the hurdle contract may not maximize its profit since no funding is provided when the budget exceeds the hurdle rate. Based on the parameters of our experiment, the optimal hurdle contract set the hurdle rate

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[8] In this study, we make use of both the P- and N2-scores to measure cognitive moral development for the following reason. First, prior studies have widespreadly used the P-score (e.g., Ponemon and Gabhart 1990; Bay and Greenberg 2001). Including it in our study allows for comparison with these studies. Second, because the N2-score is adjusted to reflect the same mean and standard deviation as the P-score, Rest et al. (1997) suggest that direct comparisons of the N2-score with the P-score are valid. Third, in spite of its increased use, the jury is still out on the role of moral judgment (as measured by the N2-score) in shaping ethical behavior; consequently, providing evidence on N2 score in the financial reporting setting helps us understand this relationship (West et al. 2004).

Table 5 Regression results of CMD and honest reporting

Dependent variable = honesty index				
Model	Unstandardized coefficients		t	Sig.
	B	SD		
Panel A: P-score				
(Constant)	.54	.043	12.44	.000
P-score	.006	.001	6.08	.000
Importance of personal earnings	−.085	.007	−12.78	.000
$R^2 = 28.6\,\%$				
Panel B: N2-score				
(Constant)	.498	.050	10.05	.000
N2-score	.006	.001	5.87	.000
Importance of personal earnings	−.080	.007	−11.82	.000
$R^2 = 28.3\,\%$				

at 5.2 lira per unit; that is, when managers submit a product cost that is higher than 5.2 lira, the firm will not fund the production. The expected corporate earnings of the optimal hurdle contract are 555 lira (Antle and Fellingham 1995).[9] We examine our research question by analyzing how participants' CMD affects corporate earnings and by comparing the corporate earnings with the expected profits from the optimal hurdle contract.

We classify our sample into three groups based on the P-score to examine the firm's profits and compare corporate earnings of each period with the outcome of the hurdle contract of 555 lira. The 30 percentile of P-score in our sample is 16.67 and the 70 percentile 40. Hence, Low P-score refers to participants with a P-score less than or equal to 16.67; Mid P-score refers to participants with a P-score greater than 16.67 and less than 40; High P-score refer to participants with a P-score greater than or equal to 40. We find that when a firm hires managers with a P-score higher than 16.67, a trust contract can yield a profit of 670.2 lira, which is significantly higher than the expected profit from the optimal hurdle contract of 555 lira (t value = 3.46, $p < .0001$) (Table 7, Panel A).[10] This

finding indicates that hiring managers with a P-score higher than 16.67 allows the firm to avoid agency costs considerably. We also classify participants into three groups based on N2-score and observe that a firm can avoid agency costs when it hires managers with N2-scores greater than 23.2 (Table 7, Panel B).

In examining our research questions, these results suggest that a trust contract (relative to a hurdle contract) achieves a better outcome when the firm employs managers with P-scores higher than 16.67 and N2-scores higher than 23.2. Since neither of these scores of our participants is relatively high, they suggest that implementing a trust contract may not be out of reach for some firms.

Discussion and Conclusion

The main objective of this study is to examine the relationship between Kohlberg's CMD paradigm (1968, 1969, 1976) and honesty in managerial reporting. We find that honest reporting is positively associated with CMD; this relationship holds even when participants' decisions directly affected their monetary payoffs. We find a positive association between CMD and honest reporting, indicating that high-CMD individuals report more honestly relative to low-CMD individuals. In typical firms, managers are in charge of production, marketing, and capital budgeting decisions, which have critical consequences for firms, employees, customers, and other stakeholders. Therefore, whether managers communicate their information truthfully to assist the firm in achieving its goal is of importance to all stakeholders.

Because of the difficulty of linking CMD to actual (un)ethical decision making and behavior, studies have relied on Ajzen's (1991) theory of planned behavior and tested intention and attitude instead of on actual behavior (e.g., Arnold and Ponemon 1991; Goolsby and Hunt 1992;

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[9] Based on our experiment parameters, the firm maximizes expected profits as the following equation: $\frac{1}{21}\left[\left(\frac{H-4}{.1}\right)+1\right](6500-1000H-250)+\frac{1}{21}\left(\frac{6-H}{.1}\right)\times(-250)$ where H is the hurdle rate per unit and subject to the constraints that $4.0 \leq H \leq 6.0$ (see Antle and Fellingham 1995). There are 21 possible costs; the probability of each cost scenario is 1/21. The $\frac{1}{21}\left[\left(\frac{H-4}{.1}\right)+1\right]$ is the possibility of a cost equal to or lower than H and $(6500-1000H-250)$ is corresponding profit from funding the production. $\frac{1}{21}\left(\frac{6-H}{.1}\right)$ is the possibility of a cost above H, and (-250) is the profit of no production. A hurdle rate of 5.2 maximizes the firm's profit, and the expected profit at this rate is 555 Lira.

[10] The 30-percentile of P-score is 16.67 with 10 participants provided a sufficient number of observations for t test. Hence, we test the firm's profit with managers at the level of P-score as 16.67 compared with the expected outcome of a hurdle contract, 555 lira. The mean of the firm's profit is 570.0 (SD, 552.5) and is insignificant from 555 ($p = .80$).

Table 6 Quadratic regression results of pooled data

Model	Unstandardized coefficients		t	Sig.
	B	SE		
Panel A: P-score				
(Constant)	.458	.066	6.94	.000
P-score	.012	.003	3.08	.003
(P-score)^2	−.000	.000	−1.64	.107
Importance of personal earnings	−.083	.007	−12.24	.000
$R^2 = 29.0\%$				
Panel B: N2-score				
(Constant)	.504	.074	6.78	.000
N2-score	.006	.004	1.36	.181
(N2-score)^2	.000	.000	.11	.911
Importance of personal earnings	−.080	.007	−11.77	.000
$R^2 = 28.3\%$				

Dependent Variable = Honesty Index

Table 7 Corporate earnings analysis

	N	Minimum	Maximum	Mean	SD	t (H0 = 555 lira)
Panel A: P-score						
Low P-score	162	250	1750	492.3	466.6	−1.69 ($p = .094$)
Mid P-score	162	250	2250	670.2	528.9	3.46 ($p < .001$)
High P-score	189	250	2250	718.8	556.7	4.05 ($p < .000$)
Panel B: N2-score						
Low N2-score	162	250	2150	466.7	394.6	−2.85 ($p = .005$)
Mid N2-score	180	250	2250	717.2	551.7	3.95 ($p < .000$)
High N2-score	171	250	2250	752.4	559.7	4.62 ($p < .000$)

Low P-score refers to participants with a P-score less than or equal to 16.67; mid P-score refers to participants with a P-score greater than 16.67 and less than 40; high P-score refer to participants with a P-score greater than or equal to 40. Low N2-score refers to participants with N2-score less than 23.2; Mid N2-score refers to participants with N2-score between 23.2 and 44; High N2-score refer to participants with N2-score greater than 44. T test is used to examine the difference between corporate earnings in each group and those under the optimal hurdle contract, namely, 555 lira

Green and Weber 1997). Our study examines the association between CMD and actual ethical decision making by applying an economic-choice experiment whereby unethical behavior led to an increase in personal payoffs without any negative consequences for the decision maker. Specifically, we structured our payments so that larger sums of cash were paid to more dishonest participants. Hence, our participants made ethical decisions that directly affected their payoffs from the experiment. Despite the fact that ethical decisions directly affected their payoffs, some of our participants chose to report either honestly or partially honestly. The extent of honest reporting is positively associated with higher CMD. This result contributes significantly to theory by establishing a positive association between CMD and actual ethical behavior.

There is a general re-emphasis on the importance and value of ethics in business because of past (e.g., Enron, WorldCom, and Parmalat) and recent (e.g., the subprime mortgage crisis and General Motors' delayed recall in the USA) business scandals caused by unethical managers. The 2014 Global Fraud Study (Association of Certified Fraud Examiners 2014) shows that, on average, organizations lose 5 % of revenue to fraud and that the median loss due to fraud was USD145,000. Consequently, business academics and professionals are re-examining the value of ethical behavior in business firms. It is important to understand the factors that affect managers' ethical actions because managers' unethical behavior affects firms' ability to achieve their business objectives.

Studies that empirically examine the relationship between CMD and actual ethical behavior show a counterintuitive result, an inverted-U-shaped relationship (Bay and Greenberg 2001; Ponemon 1993). Our study shows a linear relationship between CMD and honest reporting. The

results of our study are observed after controlling for the confounding observed in Bay and Greenberg (2001) and Ponemon (1993). Here we made use of a simple experimental task-setting in which participants can easily identify the moral issue and report honestly or dishonestly to increase personal gains. Consequently, we contribute to the theory by reporting a linear relationship between CMD and actual ethical decisions.

The results of our study have implications for firms in designing managerial compensation schemes and in hiring and training managers. The positive relationship between CMD and honest reporting suggests that firms could screen and train managers based on their level of CMD in the hiring and training process. It also suggests that firms can make use of a trust contract (i.e., one without a hurdle) if their managers have attained a higher level of CMD. Our paper suggests that the 16.67 of P-score or the 23.2 of N2-score may be used as a reference criterion. For managers with lower levels of CMD, a production hurdle together with ethical education may be required. Further field research is warranted to examine whether our results can be implemented in practice.

Our study also shows that participants for whom personal earnings were important reported a lower honesty index. This finding supports the results of prior studies that report an inverse relationship between love of money and ethical behavior (Chen and Tang 2006; Tang and Chiu 2003).

We acknowledge limitations in our study that represent opportunities for future research. Due to limited research funds, we structured our reward scale so that dishonest participants received a maximum of CAD65.25. Evans et al. (2001) paid up to USD333.33 and found no evidence that the level of dishonesty increased with the increased payoff. It is unclear whether increasing this sum even further would have caused honest and partially honest participants to report dishonestly. This could be tested by future research. Our research was carried out in a laboratory. Participants made the assumption that they worked for a fictional firm. Hence, they made decisions in a context that is devoid of organizational culture, loyalty, and work-related stress, whereas managers typically make decisions in the presence of these factors. Future research could investigate what other work-related factors besides conventional monetary incentives drive individuals' reporting behavior. Our participants made individual decisions, while in firms employees typically make decisions with co-workers. The literature suggests that referent others may play a critical role in such decision making (Fischer and Huddart 2008; Mittendorf 2007; Treviño 1986). Future studies could examine whether (un)ethical managerial reporting is influenced by referent others. Future research could also examine how individuals with various levels of CMD respond to a production hurdle contract; hence, the

research will allow for a comparison with our results and contribute to the discussion on the need for production hurdles. Further, Evans et al. (2001) finding suggests that other factors, such as the proportion of "split" of profit between head office and managers, may affect the level of honesty. Future research could examine the interaction between managers with different levels of CMD and different profit sharing proportions (between head office and managers) on (un)ethical managerial reporting.

If supported by future research, our evidence of a positive and linear relationship between CMD and honest reporting has implications for firms in their hiring and training activities. CMD can be a useful tool for a firm in identifying ethical agents. Recent economic research demonstrates that an optimal contract is contingent on the existence of ethical agents and that such a contract is less costly to the employer (Alger and Renault 2006; Fischer and Huddart 2008). Firms should take into consideration the presence of honest and partially honest managers in formulating an optimal incentive contract and designing managerial reward schemes.

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