Developments in Business Simulation & Experiential Exercises, Volume 21, 1994

USING A BUSINESS SIMULATION TO STUDY THE DETERMINANTS OF ETHICAL BEHAVIOR

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ABSTRACT

This study reports the results of an empirical investigation of the factors that influence whether an individual makes an ethical or unethical business decision. This study used a business simulation game to assess how the subjects actually behaved when confronted with an ethical dilemma as opposed to statements of expected behavior. The results found significant differences in ethical behavior across cultures and family structures. The moral development of the subject, the subjects' view of their own ethics, and their uncertainty over the presence of ethical issues also significantly affected their ethical behavior.

INTRODUCTION

This research explored why individuals behave as they do when confronted with situations that present the opportunity to act unethically. The ethical practices of people in business are a subject of considerable concern to the general public, the media, government agencies, and to business practitioners themselves (Hanson, 1985; Bird and Waters, 1989). Students (the research subjects) were presented with an ethical dilemma while managing a company in a competitive business environment created by a business simulation game. Data were collected on the students decisions regarding the ethical dilemma. These decisions formed the dependent variable in the study. Data on a number of independent variables were also collected. The business simulation game provided the environment to measure the students actual behavior instead of their statements of how they thought they would behave. The simulation also provides an environment where the subjects have a personal stake in the outcome of their decisions.

LITERATURE REVIEW

Randall and Gibson (1990) present a review and critical assessment of 94 published empirical articles on business ethics from academic journals. They conclude that the business ethics research literature is characterized by weak or nonexistent theory development, few formal tests of hypotheses, and limited formal conceptualization and operationalization of terms and measuring instruments. Kahn (1990) also complains of the lack of a framework to guide research on business ethics.

The various studies in the literature have tended to focus on different independent variables. One of the more common variables studied is the gender of the decision maker (Lifton, 1985; Tsalikis and OrtizBuonafina, 1990; Derry, 1989; Barnett and Karson, 1989; Betz, OConnell, and Shepard, 1989; and Gilligan, 1982). There is disagreement, however, among these studies on the importance of gender in explaining unethical behavior. Another independent variable studied is the affect of culture (Lysonski and Gaidis, 1991).

Another frequently studied variable is the stage of moral development of the subject (Kohlberg; 1984, 1981, 1969). The instrument most often used to measure a subject's stage of moral development is the Defining Issues Test (DIT) developed by Rest (1986, 1979). However, most of this literature treats DIT scores as the dependent variable and examines differences in moral development based on demographic and other personal characteristics. Trevino (1986) suggests that a person's stage of moral development may influence his or her moral decisions as opposed to being influenced by them. To test this hypothesis requires using the DIT as an independent variable.

Other independent variables have been suggested in nonempirical, theoretical articles by Bommer, Gratto, Gravander, and Tuttle (1987), Dubinsky and Loken (1989), Randall (1989), Reidenbach and Robin (1990), Stead, Worrell, and Stead (1990), and Jones (1991) as affecting ethical behavior. They include issues of demographics such as religion and age. However, no empirical assessment of these hypotheses has been tested as yet.

RESEARCH METHODOLOGY

The Subjects

There were four subject groups for this study: (1) graduate business students at a medium-sized mid-western, public, state university; (2) undergraduate business students at the same medium-sized midwestern, public, state university; (3) undergraduate business students at a medium-sized mid-western, Roman Catholic-affiliated, private university; and (4) undergraduate business students at a medium-sized public university in Ireland. Hereafter, these four subject groups are referred to as US-Public-Grad, US-Public-Undergrad, US-Private, and Irish, respectively. These universities were selected because they provide a contrast of schools with different cultures and missions.

The Simulations

Two business simulations were used to provide the research environment: Threshold: A Competitive Management Simulation by Anderson, Hofmeister, Scott, and Thompson (1990); and Micromatic: A Strategic Management Simulation by Scott, Strickland, Hofmeister, and Thompson (1992). Both are total enterprise simulations that required subjects to make a series of decisions over the full term of their course.

The Methodology

Previous research presented subjects with a hypothetical moral dilemma and the subject was asked what he or she would do. The subject's decision is then correlated with one or more independent variables. Note that with the methodology used in previous research, the decision maker is disconnected from the business situation and does not have to live with the consequences of the decision he or she made (Randall and Gibson, 1990).

The current research addressed these deficiencies by using a business simulation game to create an environment in which the subjects were connected to a business environment involving choices that affected the stakeholders of the team's company in ways that had ethical consequences. Since the simulation experience was conducted over a number of decision periods, the subjects also had to live with the consequences of their decisions. The performance of the subjects' company also affected the grade they received in the course, giving each subject a personal stake in the outcome.

Business simulations using students as subjects have been used successfully in other literatures. Chesney and Locke (1991) successfully used a simulation for their research on the effects of goal setting.

other studies (Hegarty and Sims, 1978; Hegarty and Sims, 1979; Rosenberg, 1987; and Fritzsche and Rosenberg, 1989) have also used a business simulation as a vehicle for assessing student behavior regarding business decisions.

The subjects were randomly placed into teams. Each team constituted a company (i.e., team of managers) that competed against other company teams in a simulated competitive business environment.

The subjects were presented with an ethical dilemma during the middle of the simulation exercise. The dilemma offered the subjects a choice of whether to pay a union official a bribe that would result in increased worker productivity, but consequently also would decrease worker safety. Data were collected on both team and individual decisions. This paper focuses on the individual decisions to avoid intragroup effects influencing ethical behavior. These decisions formed the dependent variable in the study. Note that the objectives of this study dictated that the dependent variable be a discrete, binary variable that can take on one of two possible values (pay the bribe or not), which requires the use of logistic regression, profit analysis, discriminant analysis, or a linear probability model (Maddala, 1983; Greene, 1990). This research uses a linear probability model estimated by least squares because of its familiarity and ease of interpretation of results.

The instruments

Measurement of the variables involved in the study was done using several questionnaires. These instruments and the foci of their assessment were:

Instrument	Assessment Goal
a. Defining Issues Test	stage of moral development
b. Myers-Briggs Type Inventory	personality type
c. Decision Process Questionnaire	decision process
d. Background Questionnaire	demographics

Analyses were conducted to examine the relationship between the decision made (pay the bribe or not) and the independent variables to determine if any significant relationship existed.

The independent variables hypothesized to influence the decision of whether to pay the bribe were the subjects university, age, gender, current religion, frequency of religious attendance, family status during childhood, whether they moved during their childhood, the type of school they attended during childhood, the subjects personality (Myers and McCaulley, 1985), the position of the subjects company in the simulation, the ethical principle used by the subject to decide what is ethical, the justice principle used to decide what is fair, the subject's moral development stage (DIT), the subjects perception of his or her ethics, the subject's perceptions of others' ethics, and whether the subject saw bribery as involving moral issues.

The Defining Issue Test (DIT) includes checks to see if the subjects responded in inconsistent ways or made other errors. The DIT literature recommends excluding subjects that fail these checks (Rest, 1990). Since the objectives of this paper required that the effect of each independent variable be analyzed with a multiple regression model, rather than by analyzing each independent variable with a separate simple regression, the sensitivity of results to excluding subjects with bad DITs is examined by running the multiple regression two ways: for the entire sample and for the subsample that excludes the subjects with bad DITs.

RESULTS

Subject Profile

Table 1 presents means and standard deviations of the variables in order to characterize the subjects. It shows that 38.1% of the entire sample were US-Public-Undergrads. Their average age was 22.6 years and 46.6% were female. Roman Catholics represented 61.4% of the entire sample; 39.5% of all subjects attended religious services at least once a week. During their childhood, 79.4% were raised by both parents, 57.4% moved at least once, and 39.9% attended public schools. The Myers-Briggs Type Indicator instrument showed that 64.1% of the subjects were extraverts. in the general population of the United States, about 75% are extraverts (Myers and McCaulley, 1985).

When asked how they decide what is ethical behavior, 43.0% of the subjects used the Justice Principle (fairness). When all the subjects were asked which Justice Principle they used to decide what is fair, 48.4% used Capitalism (benefits and burdens should be proportional to a person's contributions). The mean DIT overall morality score was 22.3 and the mean DIT justice score was 0.419. While general population averages for the DIT scores are not available, Aest (1990) recommends treating an overall morality score of 21 as the median. When the subjects were asked whether they consider themselves to be ethical, 97.3% reported yes. When asked whether they have friends that they consider to be more ethical, 75.3% said yes.

When the subjects were presented with the bribery dilemma, 76.7% reported that the dilemma did involve moral issues. When they were asked whether they would pay the bribe, 33.6% said yes.

Research Results

Table 2 presents four multiple regressions of the bribery decision: (1) the full model run over the entire sample, (2) a brief model that deletes some of the independent variables run over the entire sample, (3) the full model run over the subsample that excludes subjects with bad DITs, and (4) the brief model run over the subsample. The independent variables measured with binary (dummy) variables always use one of the categories as a reference category to serve as the basis of comparison. In Table 2, the reference category is denoted with a pound (#) sign.

Overall, the F-statistics indicate that the multiple regressions are explaining statistically significant amounts of variance in the willingness of the subjects to pay a bribe. In particular, the four models explain from 23.6% to 29.5% of the total variation in the willingness of the subjects to pay a bribe. Table 2 includes notations for whether the results are statistically significant at two-tail p-values of 0.10, 0.05, or 0.01. This allows the reader easily to determine the degree of statistical significance using his or her own standard.

The results from the entire sample using the full model show that controlling for the effects of the other independent variables, US-Public-Undergrads were 14.5% more likely to pay the bribe than US-Public-Grads (the reference category), US-Private students were 16.7% more likely to pay the bribe, and Irish students were 60.8% more likely to pay the bribe. Only the differences involving the Irish students were statistically significant, however. Looking across the four models, the results in Table 2 show that the Irish students were, by a statistically significant amount, more likely to agree to pay the bribe than were US-Public-Grads.

Neither age nor gender were statistically significant. Similarly, there were no statistically significant differences in willingness to pay a bribe across the various major religions. Frequency of religious attendance was also not statistically significant.

Subjects who reported that they grew up in an intact family (that is, both parents were present for the subject's entire childhood) were more likely to pay the bribe by a statistically significant amount than subjects raised by their grandparents (recall from Table 1 that 14.3%, or 32 subjects, were raised by their grandparents so that this result is not being driven by only a small number of subjects). Subjects who reported that they grew up In a non-intact family were the most likely of the three family-type groups to pay the bribe, again by a statistically significant amount.

Subjects who moved at least once during their childhood were less likely to pay the bribe than subjects who never moved, but this difference was statistically significant only in the full model that excludes the bad DITs. There were no statistically significant differences in willingness to pay a bribe across subjects who attended private, mixed, or public schools during childhood. The subject's personality, as measured by the Myers-Briggs Type Indicator, was not related to the subject's willingness to bribe. There was no statistically significant relationship between how well the subject's company was doing and the willingness of the subject to pay the bribe.

There were no statistically significant differences in the willingness to pay a bribe across subjects who differed in the ethical principle used to decide what is ethical. Similarly, there were no statistically significant differences across subjects who differed in the justice principle used to decide what is fair. Students who scored higher on the DIT overall morality scale, and who therefore should be at a higher level of moral development, were less likely to pay the bribe. This result achieves statistical significance, however, only in the brief model run over the subsample that excludes bad DITs.

Subjects who reported that they considered themselves to be ethical were more likely to pay the bribe by a statistically significant amount. Subjects who reported that they had friends they considered to be more ethical were not more likely to pay the bribe.

Subjects who were uncertain whether the bribery dilemma involved moral issues were less likely to pay the bribe than subjects who were certain the dilemma did involve moral issues; this difference is statistically significant in the subsample that excludes the subjects with bad DITs.

DISCUSSION

Significant Findings

The results of this research yielded a number of significant findings. First, Irish students were significantly more likely to pay the bribe than any of the other three subject groups. While it is unclear exactly what caused this difference, it is quite likely that culture played a strong role. In general, the Irish culture is quite open about the use of "backhanders" (i.e., bribes) in order to conduct business. It is often an accepted practice, and acknowledged as "ah, but this is Ireland."

A second significant finding related to the type of family structure in which the subject grew up. Among the three family structure groups, subjects who were raised by their grandparents were the least likely to pay the bribe, significantly less likely than subjects raised either by both parents or in a non-intact family environment. This may have occurred because the grandparents were from an earlier generation that gives greater attention to teaching values and ethics than do younger generations. The study also found that subjects who grew up in a non-intact family structure were the most likely to pay the bribe. This could be the result of the lack of time a single parent traditionally is able to devote to his or her offspring or conflicts among child, parent, and step-parent.

As was expected, subjects with higher DIT scores were less likely to pay the bribe than subjects with low scores. Given that the DIT measures moral development, it would have been surprising not to have found this relationship. However, this relationship was significant in only one of the four models. Not surprisingly, no relationship was found in the two models that did not exclude bad DITs. The insignificance of DIT in the full model that excluded bad DITs may have been the consequence of multicollinearity. To examine this possibility, a multiple regression of the DIT overall morality score was run with the variables measuring the personal characteristics of the subjects as independent variables. In this multiple regression, the multiple correlation of the DIT overall morality score with the independent variables was 0.440 in the subsample that excludes bad D4Ts, which provides evidence of multicollinearity.

Those subjects who were uncertain whether the situation posed to them involved ethical issues were significantly less likely to pay the bribe than those who saw paying the bribe as unethical behavior. One possible explanation is that uncertainty creates caution. Many subjects anecdotally reported that they knew paying the bribe was unethical, but they chose to pay it anyway. Sometimes this was in the pursuit of greater profits, sometimes it was seen as a defensive move: "Everyone else will do it, so I did to remain competitive."

Interestingly, the subjects who claimed to be ethical were those most likely to pay the bribe. Clearly, these results indicate that you cannot simply trust what a person says regarding their ethical behavior. This finding provides graphic support for why this form of research is important. If we want to better understand the factors that affect ethical behavior, it is necessary to measure actual behavior, not just ask subjects how they would behave.

Limitations & Benefits of a Business Simulation as a Research Vehicle

A natural criticism of the use of a business simulation is that: it's only a game." According to this argument, real people are not being hurt in the simulation and simulation players (unlike real managers) are not fired for poor performance. While the subjects in this research whose grades were at stake may have felt less pressure than real managers, the subjects at least had a greater stake in their decisions than in most previous research on ethics. Furthermore, if the subjects felt that it was only a game, then why not take the "higher ground" and act ethically in the simulation? That is, if subjects who see themselves as ethical cannot behave ethically when the pressures are off and the stakes are low, then why are they any more likely to behave ethically when the pressures of real life are upon them and the stakes are even higher?

The greatest benefit that comes from the use of a business simulation to study ethics is the opportunity to measure actual rather than stated behavior. As was discussed above, how people say they behave and how they actually behave are not always identical. To reach conclusions about ethical behavior without measuring it is dangerous.

Using a business simulation also allows the controlled testing of differing situations under a variety of circumstances and the ability to measure the effects of various independent variables on behavior. A controlled setting in real life is impossible and, as argued above, simply asking subjects how they would behave in certain circumstances is not likely to provide accurate information about actual behavior.

Future Research

A number of variables were found to be significantly related to ethical behavior on the part of the study's subjects. However, this research was only exploratory. There are many unanswered questions regarding why these variables were significant factors in the subjects actions. Future research should seek to confirm the significance of these variables and seek to provide insight as to why they are important

determinants of ethical behavior. Future research should also examine other cultures and ethical dilemmas.

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TABLE 1
MEANS AND DEVIATIONS OF THE VARIABLES

Variable	Entire Sample		Exclude Bad DITs	
SUBJECT'S UNIVERSITY OF CURRENT ATTENDANCE				
US – Public – Undergrad (1=yeas, 0=no)	.381	(.487)	.406	(.493)
US – Public – Grad (1=yeas, 0=no) REFERENCE CATEGORY	.121		.129	
Us – Private (1=yeas, 0=no)	-202	(.402)	.206	(.406)
Irish (1=yeas, 0=no)	.296	(.458	.259	(.439)
Age (years)	22.6	(3.97)	22.8	(.501)
Gender (1=female, 0=male)	.466	(.500)	.494	(.257)
CURRENT RELIGION				
No Religion (1=yeas, 0=no)	.058	(.235)	.071	(.257)
Roman Catholic (1=yeas, 0=no)	.614	(.488)	.600	(.491)
Protestant (1=yeas, 0=no) REFERENCE CATEGORY	.292		.300	
Other Religion (1=yeas, 0=no)	.036	(.186)	.029	(.169)
Religious Attendance (1=once or more per week, 0=less)	.395	(.490)	.376	(.486)
SUBJECT'S FAMILY STATUS DURING CHILDHOOD				
Intact Family (1=both parents, 0=otherwise)	.794	(.406)	.776	(.418)
Raised by Grandparents (1=yeas, 0=no) REFERENCE CATEGORY	.143		.165	
Not Intact Family (1=yeas, 0=no)	.063	(.243)	.059	(.236)
Moved (1=moved at least once during childhood, 0=never moved)	.574	(.496)	.565	(.497)
TYPE OF SCHOOLING DURING CHILDHOOD				
Private schools (1=yeas, 0=no)	.296	(.458)	.259	(.439)
Mixed schools (1=yeas, 0=no)	.305	(.461)	.318	(.467)
Public schools (1=yeas, 0=no) REFERENCE CATEGORY	.399		.423	
MYERS-BRIGGS TYPE INDICATOR				
Extravert vs. Introvert (1=extravert, 0=introvert)	.641	(.481)	.612	(.489)
Sensing vs. Intuition (1=sensing, 0=intuition)	.673	(.470)	.671	(.471)
Thinking vs. Feeling (1=thinking, 0=feeling)	.673	(.470)	.676	(.469)
Judgment vs. Perception (1=judgment, 0=perception)	.610	(.489)	.612	(.489)
COMPANY PERFORMANCE				
Index of Company Performance (/1000)	.044	(.049)	.043	(.051)
Index of Company performance squared (/1000)	4.34	(3.13)	4.38	(3.20)
ETHICAL PRINCIPLE USED BY SUBJECT TO DECIDE WHAT'S ETHICAL				
Egoist (1=yeas, 0=no)	.045	(.243)	.065	(.247)
Utilitarian (1=yeas, 0=no)	.148	(.356)	.129	(.337)
Rights (1=yeas, 0=no) REFERENCE CATEGORY	.359		.494	
Justice (1=yeas, 0=no)	.430	(.496)	.412	(.494)
JUSTICE PRINCIPLE USED BY SUBJECT TO DECIDE WHAT'S FAIR				
Egalitarian (1=yeas, 0=no)	.045	(.207)	.035	(.185)
Capitalism (1=yeas, 0=no)	.484	(.501)	.500	(.501)
Socialism (1=yeas, 0=no)	.265	(.442)	.265	(.442)
Libertarianism (1=yeas, 0=no) REFERENCE CATEGORY	.206		.200	
DEFININE ISSUES TEST				
DIT Morality score	22.3	(6.54)	23.2	(6.29)
DIT Justice score	.419	(1.60)	.331	(1.31)
Perceptions of own ethics (1=ethical, 0=not)	.973	(.162)	.971	(.169)
Perceptions of others' ethics (1=ethical, 0=not)	.753	(.432)	.741	(439)
PRESENCE OF MORAL ISSUES IN BRIBERY CASE				
No moral issues in dilemma (1=yeas, 0=no)	.081	(.273)	.071	(.257)
Uncertain whether dilemma has moral issues (1=yeas, 0=no)	.152	(.360)	.141	(.349)
Yes moral issues in dilemma (1=yeas, 0=no)	.767		.788	
DEPENDENT VARIABLE: Pay bribe (1=yeas, 0=no)	.336	(.451)	.312	(.465)
Sample size	223		170	

Notes: Standard deviations in parenthesis

TABLE 2
REGRESSION ANALYSIS OF BRIBERY DECISION

	Entire Sample				Exclude Bad DITs			
Independent Variable	Full Mode		Brief Model		Full Model		Brief Model	
US – Public – Undergrad	.145	(1.1)	.178	(1.6)	.133	(0.9)	.159	(1.3)
US – Public – Grad	#		#		#		#	
US – Private	.167	(0.9)	.230	(1.5)	.216	(1.1)	.279	(1.7)
Irish	.608	(3.1)***	.573	(4.8)***	.438	(1.9)*	.535	(4.1)***
Age	-.002	(0.2)			-.005	(0.5)		
Gender	-.045	(0.7)			-.076	(1.0)		
No Religion	.154	(1.0)	.168	(1.2)	.038	(0.2)	.073	(0.5)
Roman Catholic	-.080	(1.0)						
Protestant	#		#		#		#	
Other Religion	.227	(1.2)	.240	(1.3)	1.90	(0.8)	.184	(0.8)
Religious Attendance	-0.60	(0.8)			.024	(0.3)		
Intact Family	.176	(1.6)*	.229	(2.9)**	.213	(1.8)*	.247	(2.2)**
Grandparents	#		#		#		#	
Not Intact Family	.290	(1.8)*	.258	(1.8)*	.439	(2.4)**	.344	(2.1)**
Moved	-.084	(1.2)	-.071	(1.1)	-.131	(1.7)*	-.107	(1.5)
Private Schools	.018	(0.1)			.134	(0.8)		
Mixed Schools	.018	(0.2)			.056	(0.5)		
Public Schools	#				#			
Extravert vs. Introvert	.078	(1.2)			.068	(0.9)		
Sensing vs. Intuition	.069	(1.0)			.003	(0.1)		
Thinking vs. Feeling	-.056	(0.8)			-.086	(1.0)		
Judgment vs. Perception	.016	(0.2)			.020	(0.3)		
Index (/1000)	.135	(0.1)	-.101	(0.1)	.586	(0.5)	.340	(0.3)
Index Squared (/1000)	-.010	(0.7)	-.003	(0.2)	-.011	(0.7)	-.005	(0.3)
Egoist	.004	(0.1)			.136	(0.8)		
Utilitarian	-.001	(0.1)			.073	(0.6)		
Rights	#				#			
Justice	.055	(0.8)			.028	(0.4)		
Egalitarian	-.061	(0.4)			.006	(0.1)		
Capitalism	.115	(1.3)			.157	(1.5)		
Socialism	.017	(0.2)			.025	(0.2)		
Libertarianism	#				#			
DIT Morality Score	-.002	(0.5)	-.006	(1.3)	-.005	(0.9)	-.009	(1.6)
DIT Justice Score	.008	(0.4)			.002	(0.1)		
Own Ethics	.336	(1.8)*	.373	(2.0)**	.386	(1.6)*	.350	(1.7)*
Others' Ethics	.074	(1.0)			.075	(0.9)		
No Moral Issues	-.118	(1.0)	-.118	(1.1)	.055	(0.4)	.062	(0.5)
Uncertain	-.167	(1.3)	-.185	(1.5)	-.318	(2.2)**	-.312	(2.3)**
Yes Moral Issues	#		#		#		#	
Constant	-.365		-.261		-.212		-.138	
Sample Size	223		240		170		177	
R-Squared	.263		.236		.295		.264	
F (df1, df2)	2.11 (32, 190)		4.61 (15, 224)		1.79 (32, 137)		3.86 (15, 161)	
p-value	.001		.001		.011		.001	

Notes: Absolute value of t-statistics in parentheses.
* p< .10 (2-tail)
** p< .05 (2-tail)
*** p< .01 (2-tail)
# Reference Category