Organizational Influences on Scientific Integrity

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Our image of the working scientist remains inherently romantic (1). We envision an individual, working alone, pursuing knowledge in an area solely for its intrinsic interest. As attractive as the image may be, it has little to do with the realities of current work in the sciences (2, 3, 4). Scientists work in a distinctly social setting, conducting their work in both collaboration and competition with others (5, 6). This work, moreover, occurs in organizational settings, including business, government and academia. Thus, the pressures that face people working in any organization—pressures of time, conformity, resources, and production—also confront scientists.

Although one might argue that scientists, by virtue of their work, are granted more autonomy and are carefully buffered from the more "ugly" demands of organizational life, the conditions currently confronting most scientific endeavors are such that we can expect organizational pressures to become a progressively more important influence on scientific work. The emerging forces of the new economy, where innovation is the true competitive edge, move scientists from the periphery of the business world to the heart of the industrial enterprise (7). Academia, moreover, under the financial pressures imposed by funding cutbacks, has placed a new emphasis on responding to the needs of the business community (8). Finally, academia has begun a slow process, for good or ill, of learning how to manage itself differently, and manage itself like a business.

Given these pressures, there is a need to understand how organizational variables influence scientific integrity. Unfortunately, systematic studies of scientific integrity are virtually nonexistent. However, a number of scholars have sought to understand the variables that influence integrity in organizational settings as a general phenomenon. Accordingly, our intent in the present study is to examine prior studies of integrity with respect to their implications for understanding organizational influences on scientific integrity. We will begin by considering the findings obtained in one line of research concerned with the individual and situational factors that influence integrity in organizational settings. Subsequently, we will examine the kind of organizationally-based situational variables that might influence scientific integrity using a multi-level perspective that considers situational variables operating at the individual, group, and organizational levels of analysis (9).

Studies of Integrity

Psychological studies of integrity have typically employed one of two broad approaches (10). The first approach holds that integrity, or the lack thereof, is primarily a function of certain characteristics of the situation in which people find themselves. Thus, studies along these lines examine the

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opportunities provided for dishonest behavior (11), the reinforcements and punishments associated with unethical acts (12), perceptions of procedural justice (13), and stress and authority norms (14). The second approach holds that a lack of integrity is primarily a function of certain characteristics of the individual. Scholars applying this second approach have sought to develop global measures of integrity (15, 16), and identify certain unique characteristics of people that are associated with a lack of integrity (17, 18).

Individual Variables

In one series of studies along these lines, Mumford and his colleagues (19-21) sought to develop a general model of the individual characteristics likely to promote destructive or unethical acts. To identify the characteristics of individuals related to the propensity for unethical acts, Mumford and his colleagues reviewed relevant studies in the clinical (22-24), management ethics (12, 18, 25), social-personality (26-28), and criminology (29-31) disciplines. This review resulted in the identification of seven individual characteristics that might plausibly be related to socially destructive unethical behavior: 1) narcissism, 2) fear, 3) outcome uncertainty, 4) power motives, 5) object beliefs, 6) negative life themes, and 7) lack of self-regulation.

These differential characteristics were held to operate as a dynamic syndrome in shaping unethical acts. It was held that narcissism, or extreme self-absorption and overevaluation of the self leads to a motivated defense of a weak self-system (22, 32). This perception of threat, in turn, induces outcome uncertainty and activates power motives as a defensive strategy. Fear, or anxiety, is also held to lead to perceptions of threat, thereby leading to outcome uncertainty (33). When people are uncertain about their capacity to attain desired outcomes, self-protective tendencies will activate power motives, although the activation of power motives may be somewhat inhibited by the tendency of fearful individuals to withdraw.

Once activated, power motives induce a tendency to harm or exploit others which, with the resulting desensitization, may lead to the emergence of object beliefs, or the view that others can be used as tools for personal gain (14, 22). In harming others, unless such effects are inhibited by self-regulation, people are likely to acquire negative images of others and their relationships with others. Thus, object beliefs, along with fear, may lead to the emergence of negative life themes. Negative life themes, along with object beliefs, power motives, self-regulation and outcome uncertainty reflect beliefs and motives held to exert direct effects on people's willingness to engage in destructive unethical acts. Figure 1 provides a summary of the key structural relationships specified in this model.

In an initial test of the plausibility of this model, O'Connor, Mumford, Clifton, Gessner, and Connelly obtained biographies for 82 notable historic leaders (21). They content-coded the "rise to power" chapters included in each biography for leaders' expression of behaviors indicative of the seven characteristics included in this model (e.g., object beliefs, narcissism, etc.), and obtained indices of the harm done to society by leaders' policies. In a subsequent causal modeling effort, not only was support obtained for the ability of these variables to predict harm done by leaders' policies, it was found that the a priori structural model presented in Figure 1 provided adequate fit to the observed data. The resulting model is shown in Figure 2.

In the second set of investigations, Mumford, Connelly, Helton, Mowry, and Osburn sought to determine whether the variables included in this model could account for scores on standard measures of integrity (34). Here 292 subjects were asked to complete two overt measures of integrity, the Reid Report (35) and the London House PSI or Personnel Selection Inventory (36).

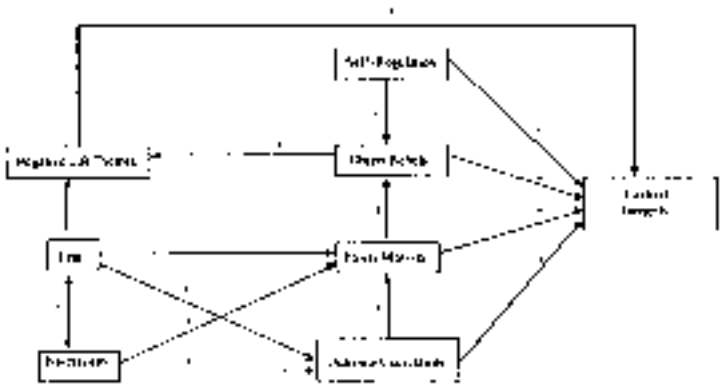
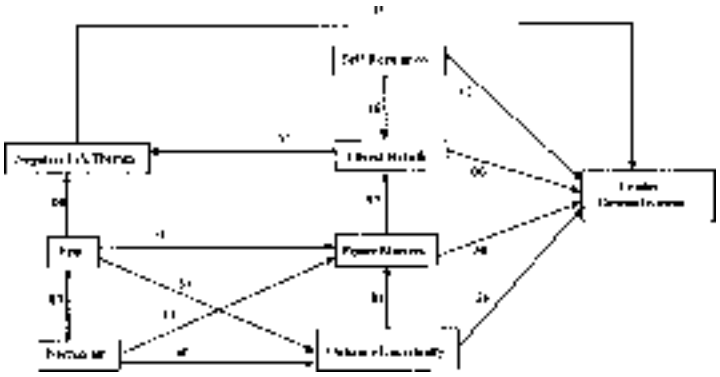


Figure 1. General structural model for individual influences on integrity.



Figures 2. Test of structural model for individual influences with respect to leader destructiveness.

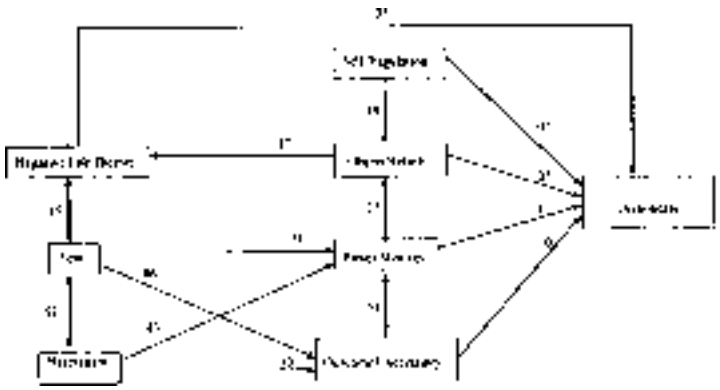
Both these measures examine theft, dishonesty, and punitive attitudes as direct markers of integrity. In addition, 400 subjects were asked to complete two commonly used personality based measures of integrity (37) – the Socialization and Delinquency scales of the California Psychological Inventory (CPI). Here background data scales were developed to measure each of the characteristics included in this model using the procedures suggested by Mumford, Costanza, Connelly, and Johnson (38). Again, it was found that the structure of the a priori model was confirmed. However, here it was found that although scores of these differential variables yielded effective prediction of integrity test scores ($\underline{r}$ = .32), the obtained prediction was not of overwhelming power. Figure 3 illustrates the nature of the results obtained in this study, while Table 1 describes the items used to measure these variables.

A potential explanation for the limited, albeit significant, impact of these variables on integrity test scores may be found in a study conducted by Mumford, Gessner, Connelly, O'Connor, and Clifton (20). In this study, 152 Masters of Business Administration (MBA) students were asked to work on an in-basket exercise which presented 32 decisions that might be made by regional sales managers. On half of the items included in this in-basket exercise, the MBA students were presented with ethical decisions where the actions selected might result in harm to others or harm to the organization.

Prior to starting work on this task, the MBA students were asked to complete the background data scales measuring the beliefs and motives relevant to integrity (e.g., object beliefs, power motives, etc.). Additionally, manipulations were made in the conditions of task performance, specifically authority norms, psychological distance, and feelings of self-efficacy. It was found that MBA students who expressed individual characteristics held to influence the occurrence of unethical acts would take unethical actions when feelings of self-efficacy were low. However, they would not necessarily make unethical decisions unless they had reason to believe that the actions taken would be supported by people in authority. Thus, it appears that situational variables might influence ethical decisions potentially interacting with individual predispositions in conditioning the occurrence of unethical behavior or, alternatively, by creating unique effects on unethical behavior.

Situational Variables

In fact, beginning with the work of Hartshorne and May (11), many scholars have argued that situational variables might exert strong effects on unethical behavior. In an initial investigation intended to identify the kind of situational variables that might influence the occurrence of unethical acts, Gessner, O'Connor, Mumford, Clifton, and Smith developed a set of life history items intended to capture exposure to situations likely to influence development, or expression of, the various individual characteristics held to



Figures 3. Test of structural model for individual influences with respect to integrity.

Individual Scales	Example Items
Object Beliefs	Surprised by how much people invest in friendships; did not do favors for people who could not return them; told white lies to get own way; viewed dealing with people as a game; has not gotten emotionally involved when dealing with people.
Power Motives	Frustrated when could not convince friends to adopt one's view; was important to be on the winning side; was willing to make a scene to get compliance from others; enjoyed making others do things; liked to have the last word.
Negative Life Themes	Enjoyed parties where people were really out of control; was not upset by media violence; spending time with family was not important; has not reflected upon one's purpose in life as much as others.
Outcome Uncertainty	Often planned for things that never happened; wished things would slow down or remain the same; worried about the future; annoyed by people who claimed something was a sure thing; wished there were more guarantees in life.
Fear	Friends thought they worried too much; often agonized over decisions; often woke up at night for no apparent reason; was bothered by things that could go wrong when things were going well; had difficulty making decisions about the future.
Narcissism	Tried to make self look good; was important to receive praise from others; spend a lot of time worrying about appearance; did not talk about things not of interest to them; did not spend time with others whose opinions were different.
Lack Of Self-Regulation	Not hard on one's self; rarely said the right thing at the right time; not important to identify own limitations; took long to fit in with an unfamiliar crowd; did not express opinions according to the situation at hand.

Table 1: Examples of Items Included in the Individual Scales

influence unethical behavior (e.g., object beliefs, outcome uncertainty, etc.) (39). A subsequent factoring of these items after they had been administered to 285 undergraduates, lead to the identification of seven situational factors: 1) alienation, 2) non-supportive family, 3) negative role models, 4) life stressors, 5) competitive pressure, 6) exposure to negative peer groups, and 7) financial need. Table 2 illustrates the nature of the items used to measure these variables.

To examine the impact of these variables on integrity, Mumford, Connelly, Helton, Mowry, and Osburn, administered the life history items measuring exposure to these situational factors to the 292 subjects asked to complete the two overt integrity tests, the Reid Report and the PSI, and the 400 subjects asked to complete the two personality-based tests, the CPI socialization and delinquency scales (34). In this study, scores on the overt and personality based measures of integrity were both correlated with, and regressed on, the seven situational scales.

The first major finding to emerge from these analyses was that the situational scales were correlated with scores on the measures of individual characteristics held to influence unethical behavior (e.g., negative life themes, object beliefs, etc.) yielding bivariate correlations in the .40s. The second major finding indicated, however, that the situational variables were strongly related to integrity test scores producing relationships in the mid-.20s to low-.50s. Of these variables, exposure to negative peer groups, alienation, and financial need appeared to produce the strongest relationships across the four measures of integrity. The third major finding to emerge in these analyses indicated that the situational variables yielded better prediction of scores on the four integrity tests than the individual variables while yielding significant gains in prediction when added to the individual variables. The results obtained in this third analysis are summarized in Figure 4 which indicates that the situational variables accounted for far more variance in integrity test scores than the individual variables.

Although these findings underscore the fundamental importance of understanding situational influences in attempts to understand and control unethical acts. These findings leave two crucial questions unanswered. First, they do

Situational Scales	Example Items
Alienation	Had worked in a setting where they saw discrimination; had superiors who were condescending; worked with people and withheld information; had belonged to organizations in legal trouble; lost something because others took advantage of status or position; often worked in situations where they could not keep up with demand.
Non-Supportive Family	Parents were not consistent in praise or punishment; parents did not explain why they punished; parents and teachers did not praise work; did not have input into important family decisions; parents and siblings did not help with schoolwork.
Negative Role Models	Parents broke promises; parents openly criticized others; often witnessed violent arguments among adults in household; parents gave harsh punishments; parents lost temper for no apparent reason; family had different standards than other families.
Life Stressors	Unable to go to school due to health; had to cope with large unexpected expenses; teachers made unrealistic work demands; had serious illness; schoolwork effected by problems of family members; was in situations where they could not keep up with work.
Competitive Pressure	Often experienced competition among co-workers; concerned about finding a good job after graduation; frequently sought recognition for work; had to be competitive to get ahead at work or school; selected people for membership in clubs; was involved in team projects.
Negative Peer Group	Friends had a cynical attitude towards society; high school and college friends had trouble with law; friends and family were heavy users of drugs and alcohol; observed people breaking rules while growing up; saw people taken advantage of; witnessed verbal/physical violence.
Financial Need	Many familites in neighborhood they grew up in received some type of public assistance; lost mother or father; regular schedule was not emphasized in family; members of family had been in trouble with law; people could take things away from them because of family position.

Table 2: Examples of Items Included in the Situational Scales

not tell us exactly how unethical acts are influenced by situational variables. For example, situational variables might constrain unethical behavior, interact with individual variables or, alternatively, compel unethical behavior in their own right. Second, these findings do not tell us about the specific kinds of situational variables that act to influence unethical behavior in the kind of organizational settings in which scientists are likely to work. Accordingly, in the following sections, we will examine the specific kinds of situational variables operating at the individual, group, and organizational levels that might influence scientific integrity.

Individual Level

Of the situational variables found to be related to integrity, stress seems to be the variable most likely to be linked to integrity in research work. Scientific work is known to be demanding and stressful resulting from multiple commitments, deadlines, the need to acquire resources, and uncertainty about project outcomes (40). When these occupational demands are combined with the intense focus characteristic of those engaged in scientific work (41), it seems plausible to argue that stress represents an endemic feature of life in the sciences. Although, up to a point, stress may contribute to productivity, high levels of stress may not only prove debilitating, but, more centrally, may contribute to incidents of unethical conduct through two distinct mechanisms (42). First, high levels of stress may lead people to take more risky actions than they might under other conditions due to the negative effects of stress on self-regulation (27). Second, stress reduces the cognitive resources available for reasoning and analytical problem solving (43). This loss in cognitive capacity is noteworthy because effective moral reasoning inhibits the occurrence of unethical acts (18, 44, 45). These observations, in turn, lead to our first

	Personality Based Tests			*Overt Tests*		
	CPI *Socialization*	**CPI** *Delinquency*	**PSI** *Honesty*	**Reid** *Honesty*	**PSI** *Theft*	**Reid** *Theft*
INDIVIDUAL SCALES						
Multiple Correlations	.42	.38	.36	.27	.25	.30
Cross Validated Multiple Correlation	.36	.31	.29	.20	.07	.17
SITUATIONAL SCALES						
Multiple Correlation	.62	.58	.57	.43	.35	.28
Cross-Validated Multiple Correlation	.49	.51	.40	.38	.26	.12
SITUATIONAL SCALES ADDED TO INDIVIDUAL SCALES						
Multiple Correlation	.67	.61	.61	.47	.41	.40
Cross-Validated Multiple Correlation	.62	.50	.58	.38	.27	.17
Change in R Square	.26**	.23**	.24**	.17**	.11**	.07*

Figure 4: Comparison of Individual and Situational Variables with Respect to the Prediction of Integrity Test Scores.
**P < .05 ** P < .01*

two propositions.

- Proposition One: Incidents of unethical behavior will be more frequent when individuals experience stress and overload.
- Proposition Two: Attempts by organizations to reduce stress by minimizing time pressure, managing overload, clarifying goals, and providing requisite resources will reduce incidents of unethical behavior.

Actions taken to reduce work demands, of course, are not the only steps that might be taken to reduce stress and unethical behavior in organizational settings. Both stress and uncertainty about outcomes are influenced by people's feelings of competence and their ability to exert positive, effective control over their work environment. In keeping with this observation, Weeks, Moore, McKenney, and Longnecker administered vignettes calling for ethical decisions to managers with greater and lesser experience (46). They found that experienced managers were more likely than their less experienced counterparts to make ethical decisions. Other studies by Arlow and Uhlrich (47), Chonko and Hunt (48), Kidwell, Stevens, and Bethke (49), and Teal and Carroll (50) also indicate that more experienced successful workers, workers with greater expertise, are less likely to engage in unethical activities or make unethical decisions. As noted above, one potential explanation for these findings is the ability of experienced, competent workers to handle stress and uncertainty. Experienced, competent workers, however, may also feel less need to take shortcuts. Regardless of the explanation used to account for these effects, however, it is clear that organizations may take a number of steps to build competence and expertise through educational and mentoring programs, careful selection of employees, and providing people with time to pursue continuing education projects (2).

Competence and expertise, of course, also allow people to induce effective control over their work environment. Given the impact of stress, outcome uncertainty, and fear on unethical acts, one would expect that control beliefs would be related to unethical behavior in organizational settings. In fact, studies by Hegarty and Sims (12), Trevino and Youngblood (18), and Reiss and Mitra (51) all indicate that people who have a strong internal locus of control are less likely to engage in unethical acts than people who believe their actions are controlled by external forces. What is important to recognize here, however, is that organizations can build feelings of control by assigning people to tasks commensurate with their capabilities, allowing input to critical decisions, and buffering people from uncontrollable events. Taken as a whole, these observations imply the following three propositions.

- Proposition Three: Less skilled or less experienced scientists will be more likely to engage in unethical acts and will be more sensitive to organizational pressures that promote unethical acts.

- Proposition Four: Organizational actions intended to develop expertise and maximize feelings of competence will inhibit unethical acts.
- Proposition Five: Organizational actions intended to maximize people's control of their environment will inhibit unethical acts.

As important as competence and control may be to the management of stress and the minimization of unethical behavior, some consideration should be given to family and social relationships. Family and social relationships, specifically supportive relationships, help people cope with stress while the implied commitment to others embedded in these relationships promotes a prosocial outlook. Accordingly, Mumford, Connelly, Helton, Mowry, and Osburn (34) found that exposure to a non-supportive family environment was related to a lack of integrity. Unfortunately scientists, in part due to their introversion (52) and, in part due to their work commitments (53), appear to have some difficulty in establishing viable family and social relationships. By the same token, however, scientists do appear to establish viable, long-term collaborative relationships and create social connections through their network of enterprise (5, 54). These observations, in turn, suggest that incidents of unethical behavior will occur less frequently among scientists who have a rich extensive network of supportive professional colleagues. Moreover, by co-locating scholars with similar interests, encouraging collaborative work, recognizing the value of multiple-authored publications, and providing time for collegial interactions, organizations can reduce incidents of scientific misconduct. Thus:

- Proposition Six: Individuals lacking collaborative networks will be more likely to be involved in incidents of scientific misconduct.
- Proposition Seven: Organizational actions intended to facilitate and recognize the value of collaborative activities will minimize incidents of scientific misconduct.

Our foregoing observations with regard to collaboration point to another factor likely to be involved in incidents of scientific misconduct – alienation. Alienation among scientists is not a strictly social phenomenon. Alienation from the work, and the work's potential contributions to society, appear particularly significant with regard to scientific misconduct because scientific work is often motivated by intrinsic interest in the work for its own sake and an abiding belief in the potential contribution of its' worth to society as a whole (55, 56). As Bowie points out, this intrinsic motivation buffers individuals from situational pressures likely to promote unethical acts (57). He notes, furthermore, that a variety of organizational policies might influence alienation and intrinsic motivation including explicit recognition of social contributions as well as contributions to the "bottom line", allowing individuals to pursue personally interesting work, and maximizing autonomy in decision-making. These observations suggest the following proposition.

- Proposition Eight: Attempts by the organization to recognize and reward social contributions and allow individuals to pursue their unique interests will reduce incidents of scientific misconduct.

Eisenberger and Cammeron, however, remind us that creative work, including scientific work, is not simply a matter of intrinsic motivation (58). People's work as scientists is also motivated by extrinsic factors such as pay, recognition, and status. At first glance, it might seem plausible to argue that extrinsic rewards lead to unethical behavior. However, the relationship between the pursuit of extrinsic rewards and unethical behavior appears somewhat more complex with the pursuit of extrinsic rewards contributing to unethical acts only when people expect that the unethical behavior will be rewarded, the unethical act will not be detected, and the act, if detected, will not be sanctioned by the organization (12, 18, 59). One implication of this expectancy model is that high performers will sometimes engage in unethical acts because they believe they are less likely to be sanctioned by the organization (60, 61)–potentially resulting in a culture that seems to condone such acts. Another implication of this expectancy model is that ethical behavior will decrease when extrinsic rewards such as pay and promotions are based on immediate short-term production demands rather than long-term contributions to others (62).

In considering the impact of production demands, however, it is necessary to bear in mind a unique characteristic of scientific work. Scientists' rewards are often explicitly tied to production such as journal publications, patents, and fielding new software (63, 64). By expressly tying extrinsic rewards to production counts, however, one can expect that misconduct will increase whenever ambitious, extrinsically motivated individuals, individuals motivated by

financial needs, status concerns, and recognition, encounter significant reverses in the production process. Thus, organizations might minimize misconduct by rewarding progress towards goals as well as production output, recognizing alternative indices of performance such as impact and innovation, and providing a minimal degree of security and visibility for all group members based on their unique strengths (65). Taken as a whole, our preceding observations about extrinsic motivation suggest the following four propositions.

- Proposition Nine: Organizational reward systems that stress long-term innovation and impact will tend to minimize incidents of unethical behavior.
- Proposition Ten: Organizational reward systems that recognize progress as well as output will tend to minimize incidents of unethical behavior.
- Proposition Eleven: Scientific misconduct will occur more frequently when extrinsic rewards are based on production and people are treated harshly for production setbacks.
- Proposition Twelve: Scientific misconduct will occur less frequently in organizations where all incidents of misconduct are treated similarly, regardless of the past performance of the people involved.

Groups

The Mumford, Connelly, Helton, Mowry, and Osburn study not only points to the influence of individual level situational influences on integrity, such as stress, relational support, alienation, and financial need, it also underscores the importance of certain group level influences (34). In this study, three variables operating at the group level, role models, exposure to negative peer groups, and competitive pressure, were found to influence integrity. Again, all three of these situation variables appear to represent important influences on integrity in organizational settings.

In organizations, role modeling is commonly subsumed under this broader area of leadership (66), and there is, in fact, reason to believe that the behavior of people assigned to formal organizational leadership roles will influence the manifest integrity of their "followers". In one study along these lines, Schminke and Wells had 81 business students participate in a four-month long strategic planning simulation (67). During the course of this simulation, measures of ethical decision-making were obtained along with measures of group process variables and leadership styles, specifically consideration and initiating structure. They found that the leaders' emphasis on initiating structure contributed to ethical decision-making, presumably because the initiation of structure led group members to focus on task accomplishment rather than personal concerns. In another study along these lines, Zabid and Alasgoff found that the behavior of people's immediate superior exerted stronger effects on the occurrence of unethical acts than other putative organizational influences such as climate and codes of conduct (68).

Leaders appear to influence ethical behavior through a variety of different mechanisms, some of which may inhibit unethical acts and some of which may promote such acts. Sims, in a study of leadership in financial services firms, identified four ways leadership behavior contributes to or promotes integrity (69). He argues that leaders promote ethical behavior by a) focusing the attention of people on ethical issues, b) responding to crises based on ethical, productive concerns rather than self-protection, c) allocating rewards based on long-term contributions rather aggressive self-promotion, and d) applying sanctions for incidents of unethical behavior. Along similar lines, Minkes, Small, and Chatterjee have argued that leaders' articulation and communication of personal, ethical, and moral values will promote integrity on the part of group members (70). Contrawise, it appears that leaders who articulate poor values or exhibit self-serving, narcissistic behavior implicitly encourage unethical behavior on the part of subordinates (71, 72). Vredenburgh and Brender point out, moreover, that leaders who consistently abuse power through arbitrary actions, a focus on personal control, and inequitable decisions, induce stress, fear, and outcome uncertainty while activating the power motive linked to unethical acts (73).

Although it seems clear that leaders have an impact on ethical behavior in general, the question remains as to whether leaders have a similar impact on the ethical behavior of scientists. One might argue that, due to their greater autonomy and specialized professional expertise, scientists are less susceptible to leader influence (66, 74). Although this argument seems plausible, the available evidence indicates that leaders exert notable effects on people's behavior in research settings (75). A case in point may be found in Hounshell's analysis of research on synthetic fabrics in Dupont's Pioneer

research laboratories where the vision defined by founders in the 1920s continued to shape the laboratories' research programs well into the 1990s (76). Nonetheless, the autonomy and expertise of scientists suggest that leader influences on ethical issues will be less evident in day-to-day direction and more evident in the leaders' a) definition of a coherent constructive research vision, b) focus on production as opposed to status relationships, and c) articulation of ethical values in interactions with staff. When these observations are considered with respect to the findings sketched out above, they suggest the following three propositions:

- Proposition Thirteen: Scientific misconduct will be less common in groups where leaders have the expertise needed to define a coherent vision for the work.
- Proposition Fourteen: Scientific misconduct will be less common in groups where the leader actively articulates ethical values, potential social contributions of the work, and enhancement of the work rather than career status.
- Proposition Fifteen: Scientific misconduct will be less common in groups where the leader focuses on effective direction of production activities rather than personal professional recognition, maintenance of control, or social acceptance.

Leadership, of course, is not the only group level variable that might influence integrity in organizational settings. For example, Mumford, Connelly, Helton, Mowry, and Osburn found that competitive pressure was related to a lack of integrity (34). The effects of competition on ethical behavior, however, appear to be quite complex in organizational settings. One way competition appears to influence ethical behavior may be found in the tendency of people to discount the relevance of moral considerations to decision-making in competitive situations (77). Another way competition influences ethical behavior is that negative perceptions of competitors' intentions provide a justification of unethical acts (78). Still another way competition influences ethical behavior is by inducing feelings of stress and uncertainty (39).

These varied mechanisms by which competition influences ethical behavior are all clearly applicable to scientists. In the case of scientists, however, it is quite possible that these negative aspects of competition represent particularly important influences on unethical acts. Scientists have been found to be highly competitive evidencing not just competitive intensity but some degree of hostility and arrogance (79)–all dispositional factors likely to make scientists particularly susceptible to the negative effects of competitive pressure. Competitive pressure, however, may not always be destructive provided it is managed effectively by the organization (80). More specifically, when competition is accompanied by respect for competitors, people feel that they have sufficient technical competence to compete effectively, and competition is viewed as a depersonalized, professional challenge, then competition may contribute to performance and ethical behavior (81, 82). These observations, in turn, suggest the following three propositions.

- Proposition Sixteen: Unethical acts are more likely to be observed when ambitious, highly competitive people are placed in competitive settings where they lack requisite skills.
- Proposition Seventeen: Organizations that take actions to reduce personalized competitive pressure by evaluating performance on an absolute rather than relative basis or by encouraging collaborative work among potential competitors are less likely to experience incidents of unethical behavior.
- Proposition Eighteen: Unethical behavior is less likely to occur when leaders, or organizational practices, encourage people to analyze and identify the merits in competitors' work.

Personalized competition within-groups, of course, may result in conflict and a lack of cohesiveness. In this regard, the Schminke and Wells study cited earlier is noteworthy. In addition to examining leadership styles and their influence on ethical decision-making, they also examined the effects of group cohesiveness (67). Here it was found that cohesiveness influenced ethical decision-making both directly with more cohesive groups making more ethical decisions and indirectly with cohesive groups evidencing higher performance which, in turn, led to more ethical decision-making. These findings suggest that actions taken to induce cohesiveness through development and articulation of a shared, common vision, use of group as well as individual rewards, integration of members work activities, and encouragement of within-group collaborative efforts will all contribute to ethical behavior. Thus, the following three propositions seem indicated.

- Proposition Nineteen: Unethical acts are more likely to occur in non-cohesive conflict-laden groups.
- Proposition Twenty: Cohesiveness within a group will reduce scientific misconduct both by enhancing performance and minimizing the negative effects of within-group competition.
- Proposition Twenty-One: Organizational actions that lead to higher cohesiveness, such as development of a shared vision on the allocation of group, as well as individual, rewards, will reduce incidents of scientific misconduct.

Although it appears that cohesiveness may contribute to integrity, a cautionary note seems in order. Many prior studies of groups, including destructive behavior on the part of groups, indicate that conformity pressures can induce destructive, unethical behavior when the primary concern is maintenance of harmonious group relations and the goals being pursued by the group are likely to result in destructive, unethical behavior (24, 83). Hence:

- Proposition Twenty-Two: When high levels of cohesiveness prohibit questioning of group actions, cohesiveness may be related to unethical acts.

As implied by our foregoing proposition, exposure to the behaviors of, and expectations imposed by, other group members may influence ethical behavior in organizational settings (34). Exposure to peer groups is commonly held to influence integrity through the models for appropriate behavior provided by other group members and the normative expectations imposed on people by other members of the group (39, 84). Accordingly, Murphy has argued that anomie, or normlessness, will engender unethical behavior because group members lack models for appropriate behavior and sanctions are not imposed for unethical acts (10). In keeping with argument, Leede, Nijhof, & Fisscher, note that when groups are experiencing conditions of rapid change the resulting breakdown in extant normative structures may lead to an increase in the frequency of unethical acts (85). Thus,

- Proposition Twenty-Three: When groups are experiencing rapid changes in personnel, technology, or productions processes, incidents of unethical behavior will increase.

The notion that normlessness will contribute to the occurrence of unethical acts also implies that the presence of normative expectations for ethical behavior among group members will contribute to integrity. As might be expected, the bulk of the available evidence does indicate that ethical norms within a group lead to ethical behavior. For example, studies by Barnett (86), Kawathatzopoulos (87), Verbke, Ouwerkerk, and Peelen (88), and Weaver and Farrell (89) indicate that when groups communicate expectations for ethical behavior, and sanction violations by group members, ethical decision-making improves and unethical acts become less frequent. In this regard, however, it is important to bear in mind a point made by Fritz, Arnett, and Conkel (90), Grimalda (91), and Schokkaert and Sweeney (92). More specifically, the effects of group norms on ethical behavior will vary with people's commitment to the group. Accordingly, the following three propositions seem indicated.

- Proposition Twenty-Four: Ethical behavior will be more common in groups that have, and actively apply, positive normative standards in group decision-making and the application of sanctions.
- Proposition Twenty-Five: The effects of ethical norms on integrity depend on building feelings of commitment to the group, the organization, or the profession.
- Proposition Twenty-Six: the creation and articulation of normative ethical standards by leaders on professional organizations will prove less effective when groups are experiencing rapid change and commitment is low.

Organizations

The Mumford, Connelly, Helton, Mowry, and Osburn study focused primarily on situational factors operating at the individual or group level (34). As a result, this study does not directly address the various organizational level variables that might be related to integrity. Nonetheless, the nature of the individual and group based situational influences on integrity do suggest that certain organizational level variables will also influence integrity. One set of organizational level influences suggested by our foregoing observations is the organization's operating environment—specifically three features of the organization's operating environment turbulence, munificence, and interdependence.

Environmental turbulence refers to rapid changes in technology, business processes, product markets, and competitors (93). Of course, turbulence will lead to normlessness as well as uncertainty about the requirements for

effective performance, both conditions that can be expected to promote unethical acts. Accordingly, Morris, Marks, Allen, and Perry found that ethical values were less evident among people working for organizations operating in a turbulent environment (94). Along similar lines, Rossouw has argued that the turbulence induced by social disruption can lead to unethical acts on the part of organizations (95). Among scientists, however, it seems likely that turbulence will exert larger effects when its impact is evident in their immediate technical environment or in employment practices. These observations, in turn, lead to the following two propositions.

- Proposition Twenty-Seven: As turbulence increases in the organization's operating environment the frequency of unethical acts will increase.
- Proposition Twenty-Eight: Scientific misconduct will increase in periods of rapid change in technological paradigms and employment practices.

In contrast to turbulence, munificence refers to the availability of resources and the low degree of competitive pressure evident in the organizations' operating environment. In fact, the available evidence indicates that munificence is related to ethical conduct in organizational settings. For example, Verschoor (96), in a study of Fortune 500 companies, found that ethical conduct with regard to organizational shareholders increased with financial performance while Judge (97), in a study of hospitals, found that scarcity of financial resources was negatively related to social contributions. In still another study along these lines, Zarkada-Fraser found that collusion in government project bids was related to project desirability and competition (98). Among scientists, where resources are critical to conducting requisite research work, non-munificent environments may encourage unethical acts as a way of insuring resource availability. Thus,

- Proposition Twenty-Nine: As the munificence of the organizations operating environment decreases, unethical behavior and incidents of scientific misconduct will increase.

A third, and final, environmental variable commonly linked to ethical behavior in organizational settings is interdependence, or the extent to which organizational success depends on maintaining viable relationships with other organizations including suppliers, alliance partners, or government agencies. As might be expected, high interdependence appears to promote ethical behavior (99, 100, 101). Although it is unclear exactly what mechanisms shape the influence of interdependence on ethical behavior the following proposition does seem indicated:

- Proposition Thirty: Unethical behavior occurs less frequently in organizations where performance depends on the support, or goodwill, of other entities.

The organization's operating environment is, of course, one influence on the structure of the organization. Structure, or the manifest division of labor in an organization, has not commonly been studied as an influence on integrity. However, the available evidence indicates that unethical acts are less likely to occur in small organizations (102, 103) and in organizations where roles and responsibilities are clearly defined (85, 104). One explanation for this pattern of findings may be found in diffusion of responsibility and its derivative effects or alienation. In keeping with this alienation and diffusion of responsibility notion, Dooley and Fryxell found that diversification was related to corporate pollution levels (105). These observations imply the following proposition:

- Proposition Thirty-One: As organizational structures become more complex, and roles and role accountability are less clearly defined for individuals, unethical acts will become more frequent.

While structure refers to the organization of the work, climate refers to people's perceptions of social interactional expectations with their work environment (106). Relative to structure, climate has received substantially more attention as a potential influence on ethical behavior in organizational settings. In one study along these lines, Sims and Keon administered five business scenarios calling for an ethical decision to 245 business students who were also asked to complete a survey describing the company for which they were currently working (107). It was found that perceptions of their work environment were related to ethical decision-making. Similar findings have been obtained by Baumhart (59).

Although there is reason to believe that organizational climate influences ethical behavior, more debate surrounds the nature of the specific climate dimensions involved. Agarwal and Malloy identify five climate dimensions related to ethical behavior:

1) individual caring 2) social caring, 3) independence, 4) Machiavellianism, and 5) law and code (108). Vidaver-Cohen proposes a different model of ethical climate which stresses the importance of 1) social responsibility, 2) social support, 3) avoiding harm of others, 4) task support, and 5) equity of reward procedures (109). Still another model, one proposed by Key, views climate as a function of: 1) day-to-day reinforcement of ethical conduct, 2) punishment of unethical conduct, and 3) management role modeling (110). Finally, Argadona and Hartman, Yrle, and Galle argue that trust and perceptions of distributive and procedural justice represent key organizational climate dimensions influencing ethical behavior on organizations (111, 112).

While a variety of models of ethical climate are available, it seems likely that some of these dimensions will prove more important than others in shaping the ethical behavior of scientists. Given the hostility and competitiveness characteristic of scientists (79), it seem plausible to argue that climates stressing trust and social support while maintaining perceptions of procedural and distributive justice will prove particularly important in minimizing misconduct (7). The demands of creative work, moreover, suggest that climates reinforcing autonomy, openness, and minimization of premature criticism will also prove useful in enhancing ethical behavior (75, 113). Thus, the following two propositions seem indicated.

- Proposition Thirty-Two: Organizational climates that promote perceptions of trust and fairness will minimize incidents of scientific misconduct.
- Proposition Thirty-Three: Organizational climates that are open and not overly critical of new ideas will minimize incidents of scientific misconduct.

The climate literature, however, also underscores the importance of day-to-day reinforcement on ethical conduct. In the case of scientists, the importance of ethical standards implies that professional codes, as well as their acceptance and embodiment by the organization, will also influence incidents of scientific misconduct. In fact, studies by Weaver and Farrell (89) of American Marketing Association members, and Gotterbarn (114) of software engineers, indicate that professional codes are viewed as important influences on ethical behavior in the sciences and may lead to improvements in ethical decision-making.

On the other hand, however, there is no assurance that professional ethical codes will be adopted by organizations in their day-to-day practices. This point is nicely illustrated in a study by Etheredge who examined attitudes toward ethical behavior in business managers and identified two dimensions: a) the importance of ethics and social responsibility, and b) subordination of ethics and social responsibility to organizational effectiveness (115). Thus, organizations in their quest for efficiency and control, may reject professional ethical standards that conflict with organizational needs. When organizations reject these professional standards, however, it can be expected that the resulting organizational-professional conflict will induce some stress as people are forced to choose between these competing expectations. Although a number of considerations will influence how this conflict is resolved, it appears that investment in the organization, as opposed to the profession, is of critical importance (116). Accordingly, the following three propositions seem indicated.

- Proposition Thirty-Four: Incidents of scientific misconduct will be less common among individuals who are more invested in the profession rather than the organization they are working.
- Proposition Thirty-Five: Incidents of scientific misconduct will be less common in organizations that rely on their professional technical reputation for market advantage and view organizational needs as consistent with professional ethical codes.
- Proposition Thirty-Six: Professional ethical codes will prove most effective in reducing scientific misconduct when codes are actively supported by the organization.

Conclusions and Directions

Figure 5 summarizes the various propositions we have proposed with respect to the situational variables influencing ethical behavior at the individual, group, and organizational levels. In reviewing these propositions, however, an important caveat seems in order. More specifically, although all of the propositions were formulated based on a review of the organizational literature as it relates to the situational variables influencing integrity. Few, if any, studies have directly examined the influence of organizational, situational variables on research integrity. Thus, these propositions should not be viewed as well established

Individual Level

1) Incidents of unethical behavior will be more frequent when individuals experience stress and overload
2) Attempts by organizations to reduce stress by minimizing time pressure, managing overload, clarifying goals, and providing requisite resources will reduce incidents of unethical behavior
3) Less skilled or less experienced scientists will be more likely to engage in unethical acts and will be more sensitive to organizational pressures that promote unethical acts
4) Organizational actions intended to develop expertise and maximize feelings of competence will inhibit unethical acts
5) Organizational actions intended to maximize people's control of their environment will inhibit unethical acts
6) Individuals lacking collaborative networks will be more likely to be involved in incidents of scientific misconduct
7) Organizational actions intended to facilitate and recognize the value of collaborative activities will minimize incidents of scientific misconduct
8) Attempts by organizations to recognize and reward social contributions and allow individuals to pursue their unique interests will reduce incidents of scientific misconduct
9) Organizational reward systems that stress long-term innovation and impact will tend to minimize incidents of unethical behavior
10) Organizational rewards that recognize progress as well as output will tend to minimize incidents of unethical behavior
11) Scientific misconduct will occur more frequently when extrinsic rewards are based on production and people are treated harshly for setbacks
12) Scientific misconduct will occur less frequently in organizations where all incidents of misconduct are treated similarly regardless of past performance

Group Level

13) Scientific misconduct will be less common in groups where leaders have the expertise needed to define a coherent vision for the work
14) Scientific misconduct will be less common in groups where the leader actively articulates ethical values, potential social contributions of the work and enhancement of the work rather than career status
15) Scientific misconduct will be less common in groups where the leader focuses on effective direction of production activities rather than personal professional recognition, maintenance of control, or social acceptance
16) Unethical acts are more likely to be observed when ambitious, highly competitive people are placed in competitive settings where they lack requisite skills
17) Organizations that take actions to reduce personalized competitive pressure by evaluating performance on an absolute rather than relative basis or by encouraging collaborative work among potential competitors are less likely to experience incidents of unethical behavior
18) Unethical behavior is less likely to occur when leaders, or organizational practices, encourage people to analyze and identify the merits in competitors' work
19) Unethical acts are more likely to occur in non-cohesive, conflict-laden groups
20) Cohesiveness within a group will reduce scientific misconduct both by enhancing performance and minimizing the negative effects of within group competition
21) Organizational actions that lead to higher cohesiveness such as development of a shared vision or the allocation of group as well as individual rewards will reduce incidents of scientific misconduct
22) When high levels of cohesiveness prohibit questioning of group actions, cohesiveness may be related to unethical acts
23) When groups are experiencing rapid changes in personnel, technology, or production progress, incidents of unethical behavior will increase
24) Ethical behavior will be more common in groups that have, and actively apply, positive normative standards in group decision-making and the application of standards
25) The effects of ethical norms on integrity may depend on building feelings of commitment to the group, organization or profession
26) The creation and articulation of normative ethical standards by leaders in professional organizations will prove less effective when groups are experiencing rapid change and commitment is low

Organizational Level

27) As turbulence increases in the organization's operating environment, the frequency of unethical acts will increase
28) Scientific misconduct will increase in periods of rapid change in technological paradigms and employment practices
29) As the munificence of the organization's operating environment decreases, unethical behavior and incidents of scientific misconduct will increase
30) Unethical behavior will occur less frequently in organizations where performance depends on the support, or goodwill, of other entities
31) As organizational structures become more complex, and roles and role accountability are less clearly defined for individuals' unethical acts will become more frequent
32) Organizational climates that promote perceptions of trust and fairness will minimize incidents of scientific misconduct
33) Organizational climates that are open and not overly critical of new ideas will minimize incidents of scientific misconduct
34) Incidents of scientific misconduct will be less common among individuals who are more invested in the profession rather than the organization for which they are working
35) Incidents of scientific misconduct will be less common in organizations that rely on their professional or technical reputation for market advantage and view organizational needs as consistent with professional ethical codes
36) Professional ethical codes will prove most effective in reducing scientific misconduct when codes are actively supported by the organization

Figure 5. Summary of Propositions at Individual, Group, and Organizational Levels

conclusions but, instead, as a set of hypotheses that might be used to guide further research.

The need for further research along these lines becomes even more salient when one takes two other considerations into account. First, although the propositions presented in the present effort all seem plausible, evidence is not available examining the relative importance of these various situational variables on scientific misconduct and research integrity. For example, given the known dispositional characteristics of scientists (79), it seems attractive to argue that

competition, conflict, and a lack of cohesiveness will have a greater impact on misconduct than the direction provided by a leader. Unfortunately, however, evidence allowing us to evaluate the relative importance of various situational influences within and across three levels of analysis is, at this juncture, simply not available.

Second, in formulating these propositions we have examined organizations as a general phenomenon drawing heavily from past research in the "for profit" business arena (18, 107). What must be recognized here, however, is that scientists' work occurs in a variety of settings aside from the business arena including universities, government agencies, and non-profit research institutes. As a result, the unique characteristics of these non-business settings may influence the relative importance of the various situational variables identified in the present effort. A case in point can be found in our observations about organizational conflicts with professional codes of ethics since such conflicts maybe less pronounced outside the business setting. Thus, there is a need to assess the generality of these propositions across work settings.

Even bearing these caveats in mind, however, we believe that the present study does lead to some noteworthy conclusions about research integrity. To begin, we tend to attribute incidents of misconduct to characteristics of the individual. Although the importance of the scientist's character is not to be underestimated, the results obtained in the present effort suggest that situational variables have a large, perhaps a larger, impact on integrity than individual variables. Although this argument is by no means unique (11), it does suggest that future studies of research integrity should give as much attention to situational and individual influences.

The present effort, moreover, has served to identify an initial set of situational variables that should be examined in studies of research integrity. The Mumford, Connelly, Helton, Mowry, and Osburn study underscores the importance of stress, alienation, support, need, role models, peer groups, and competitive pressure (34). In this paper we have provided some evidence that these same situational pressures might also be operating in organizational settings. For example, stress appears to be a potentially significant influence on incidents of misconduct at the individual level while competitive pressure appears to influence integrity at the group level. These individual and group level situational influences, moreover, appear to be associated with a coherent set of organizational level influences such as turbulence and munificence.

In identifying the situational variables operating at the individual, group, and organizational levels, moreover, it becomes possible to draw inferences about the conditions under which incidents of misconduct are most likely to be observed and the actions that might be taken by organizations to reduce incidents of misconduct. For example, support appears to be related to misconduct with individuals lacking collaborative networks and broader social support being more vulnerable to misconduct. Organizations, however, by encouraging people to collaborate and build a strong network of professional connections, may do much to minimize misconduct. Similarly, while competitive pressure apparently plays a notable role in scientific misconduct, such simple strategies as avoiding person-to-person comparisons and insuring adequate resources are available may do much to minimize the occurrence of misconduct. Hopefully, the present effort will serve not only as a framework for further research examining the impact of situational variables on scientific misconduct but will provide a basis for formulating new policies that will help insure the integrity of the research process. In fact, given the changes occurring in many scientific fields, there may well in the future be an even more pressing need for practical guidelines along these lines as the rarefied world of science comes into ever closer contact with the manifold demands and pressures of the modern organization.

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Bibliography

1. Mumford MD, Baughman WA, Sager CE. Picking the right material: Cognitive processing skills and their role in creative thought. In: Runco MA, ed. Critical Creative Thought. Cresskill, NJ: Hampton; 2000.
2. Mumford MD, Gustafson SB. Creativity syndrome: Integration, application, and innovation. Psychol Bull. 1985;103:27-43.
3. Policastro E, Gardner H. From case studies to robust generalizations: An approach to the study of creativity. In: Sternberg RJ, ed. Handbook of Creativity. Cambridge, England: Cambridge University Press; 1999.
4. Weber RJ, Perkins DN. Inventive Minds: Creativity in Technology. Cambridge, England: Cambridge University Press; 1992.
5. Abra J. Collaboration in creative work: An initiative for investigation. Creativity Res J. 1994;7:1-20.
6. Dunbar K. How scientists really reason: Scientific reasoning in real world laboratories. In: Sternberg RJ, Davidson JE, eds. The Nature of Insight. Cambridge, MA: MIT Press; 1995:365-96.
7. Ruppel CP, Harrington SJ. The relationship of communication, ethical work climate, and trust to commitment and innovation. J Business Ethics. 2000;17:1563-71.
8. Press E, Washburn J. The Kept University. Atlantic. 2000;285:39-55.
9. Dansereau F, Yammarino FJ. Introduction and overview. In: Dansereau F, Yammarino FJ, eds. Leadership: the Multiple Level Approaches. Stanford, CT: JAI Press; 1998:xxv-li.
10. Murphy KA. Honesty in the Work Place. Pacific Grove, CA: Brooks/Cole; 1993.
11. Hartshore H, May MA. Studies in Deceit. New York: MacMillian; 1928.
12. Hegarty WH, Sims H. Some determinants of unethical decision behavior: An experiment. J Appl Psychol. 1978;58:111-21.
13. Victor BC, Trevino K, Shapiro DL. The influence of justice evaluations and social context factors. J Business Ethics. 1993;12:253-63.
14. Darley JM. Social organization for the production of evil. Psychol Inquiry. 1992;3:199-218.
15. Ones DS, Viswesvaran C, Schmidt FL. Comprehensive meta-analysis of integrity test validities: Findings and implications for personnel selection and theories of job performance. J Appl Psychol Monograph. 1993;78:674-703.
16. Sackett PR, Waneck JE. New developments in the use of measures of honesty, integrity, conscientious, dependability, trustworthiness, and reliability for personnel selection. Personnel Psychol. 1996;49:787-829.
17. Hogan J, Brinkmeyer K. Bridging the gap between overt and personality-based integrity tests. Personnel Psychol. 1997;50:587-600.
18. Trevino L, Youngblood SA. Bad apples in bad barrels: A causal analysis of ethical decision making behavior. J Appl Psychol. 1990;75:378-85.
19. Holt RW, Clifton TC, O'Connor JA, Smith TC, Gessner TC, Mumford MD. Influences of destructive personality information on juror decision making. J Appl Social Psychol. 1997;27:781-99.
20. Mumford MD, Gessner TE, Connelly MS, O'Connor JA, Clifton TC. Leadership and destructive acts: Individual and situational influences. Leadership Q. 1993;4:115-48.
21. O'Connor JA, Mumford MD, Clifton TC, Gessner TE, Connelly MS. Charismatic leaders and destructiveness: A historiometric study. Leadership Q. 1995;6:529-55.
22. Fromm E. The Anatomy of Human Destructiveness. New York, NY: Holt, Rhinehart, & Winston; 1973.
23. Gough HG. A sociological theory of psychopathy. Am J Sociology. 1998;53:359-66.
24. Staub E. The Roots of Evil: The Origins of Genocide and Other Group Violence. Cambridge, MA: Cambridge University Press; 1989.
25. Robin DP, Reidenbach RE, Forrest PJ. The perceived importance of an ethical issue on the ethical decision making of ad managers. J Business Ethics. 1996;35:17-28.
26. Blass T. Understanding behavior in the Milgram Obedience experiment. The role of personality, situations, and interactions. J Pers Soc Psychol. 1991;60:348-413.
27. Leith KP, Baumeister RF. Why do bad moods increase self-defeating behavior? Emotion, risk-taking, and self-regulation. J Pers Soc Psychol. 1996;71:1250-67.
28. Oyserman D, Markus HR. Possible selves and delinquency. J Pers Soc Psychol. 1990;59:112-25.
29. DiLalla LF, Gottesman II. Heterogeneity of causes for delinquency and criminality: Lifespan perspectives. Dev Psychopathology. 1990;1:339-49.
30. Reid JB, Patterson GR. The development of antisocial behavior patterns in childhood and adolescence. Eur J Pers. 1989;3:107-19.
31. Walters GD. The Criminal Lifestyle: Patterns of Serious Criminal Conduct. Newberry Park, CA:Sage; 1990.
32. Emmons RA. Relationship between narcissism and sensation seeking. Psychol Rep. 1981;48:247-50.
33. Riskind JH, Kelly K, Harmen W, Moore R, Gaines HS. The loomingness of danger: Does it discriminate all phobia and general anxiety from depressing? Cognitive Ther Res. 1992;16:602-22.
34. Mumford MD, Connelly MS, Helton WB, Mowry JR, Osburn HK. On the construct validity of integrity tests: Individual and situational factors as predictors of test performance. Int J Selection Assessment. [In press].
35. Ash P. Predicting dishonesty with the Reid Report. J Am Polygraph Assoc. 1985;5:139-45.
36. Harris MM, Sackett PR. A factor analysis of an employee honesty test. J Business Psychol. 1987;2:122-35.
37. Gough HG. The California Psychological Inventory. In: Newmark CS, ed. Major Psychological Assessment Instruments: Volume II. Boston, MA: Allyn and Bacon; 1989:67-98.

38. Mumford MD, Costanza DP, Connelly MS, Johnson JF. Item generation procedures and background data scales: Implications for construct and criterion-related validity. Personnel Psychol. 1996;49:361-98.
39. Gessner TE, O'Connor JA, Mumford MD, Clifton TC, Smith JA. Situational variables influencing the propensity for destructive acts: Taxonomy development and validation. Curr Psychol. 1995;13:303-25.
40. Wild JT. The origin of soft-tissue ultrasonic echoing and early instrumental application to clinical medicine. In: Weber RJ, Perkins DN, eds. Inventive Minds: Creativity in Technology. Cambridge, England: Cambridge University Press; 1992.
41. Gruber HE, Wallace DB. The case study method and evolving systems approach for understanding unique creative people at work. In: Sternberg RJ, ed. Handbook of Creativity. Cambridge, England: Cambridge University Press; 1999:93-115.
42. Vosberg SK. The effects of positive and negative affect on divergent thinking performances. Creativity Res J. 1998;11:165-72.
43. Fiedler FE, Garcia JE. New Approaches to Effective Leadership: Cognitive Resources and Organizational Performance. New York: Wiley; 1987.
44. Chang MK. Predicting unethical behavior: A comparison of the theory of reasoned action and the theory of planned behavior. J Business Ethics. 1998;17:1825-34.
45. Goolsby JR, Hunt SD. Cognitive moral development and marketing. J Marketing. 1992;56:55-68.
46. Weeks WA, Moore CW, McKinney JA, Longenecker JG. The effects of gender and career stage on ethical judgement. J Business Ethics. 1999;20:301-13.
47. Arlow P, Ulrich TA. Business ethics and social responsibility of business students: An empirical comparison of Clark's study. Akron Business Economic Rev. 1980;11:17-23.
48. Chonko LB, Hunt SB. Ethics and marketing management: An empirical examination. J Business Res. 1985;13:339-59.
49. Kidwell JM, Stevens RC, Bethke RL. Differences in the ethical perceptions between male and female managers: Myth or reality. J Business Ethics. 1987;6:489-93.
50. Teal EJ, Carroll AB. Moral reasoning skills: Are entrepeneurs different. J Business Ethics. 1999;19:229-40.
51. Reiss MC, Mitra K. The effects of individual difference factors on the acceptability of ethical and unethical workplace behaviors. J Business Ethics. 1998;17:1581-93.
52. Feist GJ, Gorman ME. The psychology of science: Review and integration of a nascent discipline. Rev Gen Psychol. 1998;2:3-47.
53. Feldman DH. The development of creativity. In: Sternberg RJ, ed. Handbook of Creativity. Cambridge, England: Cambridge University Press; 1999:169-88.
54. Csikszentmihalyi M. Implications of a system's perspective for the study of creativity. In: Sternberg RJ, ed. Handbook of Creativity. Cambridge, England: Cambridge University Press; 1996:313-38.
55. Amabile TM. Motivational synergy: Toward new conceptualizations of intrinsic and extrinsic motivation in the work place. Hum Resource Management Rev. 1993:3;185-201.
56. Collins MA, Amabile TM. Motivation and creativity. In: Sternberg RJ, ed. Handbook of Creativity. Cambridge, England: Cambridge University Press; 1999:297-312.
57. Bowie NE. A Kantian theory of meaningful work. J Business Ethics. 1998;17:1083-92.
58. Eisenberger R, Cammeron J. Detrimental effects of reward: Reality or myth? Am Psychol. 1996;51:1153-6.
59. Baumhart R. How ethical are businessman. Harvard Business Rev. 1961;39:6-19.
60. Bellizi JA, Hite RE. Supervising unethical sales force behavior. J Marketing. 1989;53:36-47.
61. Deconinck JB. How sales managers control unethical sales force behavior. J Business Ethics. 1992;11:789-98.
62. Harrison JS, Fiet JO. New CEOs pursue their own self-interests by sacrificing stakeholder value. J Business Ethics. 1999;19:301-8.
63. Pelz DC, Andrews FM. Scientists in Organizations: Productive Climates for Research and Development. New York: Wiley; 1966.
64. Simonton DK. Historiometric studies of creative genius. In: Runco MA, ed. The Creativity Research Handbook: Volume One. Cresskill, NJ: Hampton Press; 1997:3-28.
65. Mullins RF, Sherman R. Creativity and performance appraisal: Shall never the twain meet. Creativity Res J. 1993;6:425-34.
66. Yukl G. Leadership in Organizations. Englewood Cliffs, NJ: Prentice-Hall; 1998.
67. Schminke M, Wells D. Group processes and performance and their effects on individual's ethical frameworks. J Business Ethics. 1999;18:367-81.
68. Zabid ARM, Alasgoff, SK. Perceived ethical values of Malaysian managers. J Business Ethics. 1993;12:331-7.
69. Sims RR. Changing an organization's culture under new leadership. J Business Ethics. 2000;25:65-78.
70. Minkes AC, Small MW, Chatterjee SR. Leadership and business: Does it matter? Implications for management. J Business Ethics. 1999;20:327-35.
71. House RJ, Howell JM. Personality and charismatic leadership. Leadership Q. 1992;3:81-108.
72. Meyer AG, Brown T, Browne MN, Kubasek N. Do we really want more leaders in business? J Business Ethics. 1998;17:1727.
73. Vredenburgh D, Brender Y. The hierarchical abuse of power in work organizations. J Business Ethics. 1998;17:1337-1347.
74. Baron F, Harrington D. Creativity, intelligence, and personality. Annu Rev Psychol. 1981;32:439-76.
75. Mumford MD, Whetzel DC, Reiter-Palmon R. Thinking creatively at work: Organizational influences on creative problem solving. J Creative Behav. 1997;31:7-17.

76. Houndshell DA. Invention in the industrial research laboratory: Individual act on collective process? In: Weber RN, Perkins DN, eds. Inventive Minds: Creativity in Technology. Cambridge, England: Cambridge University Press; 1992:273-390.
77. Reall M, Bailey JJ, Stoll SK. Moral reasoning on hold during a competitive game. J Business Ethics. 1998;17:1205-10.
78. Schwepker CH. Understanding salespeople's intention to behave unethically: The effects of perceived competitive intensity, cognitive moral developments, and model judgement. J Business Ethics. 1999;21:303-16.
79. Feist GJ. The influence of personality on artistic and scientific creativity. In: Sternberg RJ, ed. Handbook of Creativity. Cambridge, England: Cambridge University Press; 1999:273-96.
80. Zuckerman H, Cole JR. Research strategies in science: A preliminary inquiry. Creativity Res J. 1994;7:391-406.
81. Pelton LE, Chowdhury J, Vitell SJ. A framework for the examination of relational ethics: An interactionist perspective. J Business Ethics. 1999;19:241-53.
82. Rallapalli KC, Vitell SJ,, Szeinbach S. Marketers' norms and personal values: An empirical study of marketing professionals. J Business Ethics. 2000;24:65-75.
83. Cote J, Goodstein J. A breed apart? Aecurity analysis and herding behavior. J Business Ethics. 1999;18:305-14.
84. Gessner TE, O'Connor JA, Clifton TC, Connelly MS, Mumford MD. The development of moral beliefs: A retrospective study. Curr Psychol. 1993;11:236-59.
85. Leede JD, Nijhof AHJ, Fisscher OAM. The myth of self-managing teams: A reflection on the allocation of responsibilities between individuals, teams, and the organization. J Business Ethics. 1999;21:203-15.
86. Barnett T. A preliminary investigation of the relationship between selected organizational characteristics and external whistle blowing by employees. J Business Ethics. 1992;11:949-59.
87. Kawathatzopoulos I. Development of cognitive skill in solving business ethics problems: The effect of instruction. J Business Ethics. 1993;12:379-86.
88. Verbke WC, Ouwerkerk C, Peelen E. Exploring contextual and individual factors on ethical decision-making of sales people. J Business Ethics. 1996;15:1175-87.
89. Weaver KM, Farrell OC. The impact of corporate policy in reported ethical beliefs and behavior of marketing practicioners. AMA Proc. 1977;27:477-81.
90. Fritz JMH, Arnett RC, Conkel M. Organizational ethical standards and ethical commitment. J Business Ethics. 1999;20:289-92.
91. Grimalda G. Participation versus social exclusion. J Business Ethics. 1999;21:269-79.
92. Schokkaert E, Sweeney J. Social exclusion and ethical responsibility: Solidarity with the least skilled. J Business Ethics. 1994;21:251-67.
93. Castrogiovani GT. Pre-start-up planning and the survival of new small businesses: Theoretical linkages. J Management. 1996;22:801-22.
94. Morris MH, Marks AS, Allen JA, Perry NS. Modeling ethical latitudes and behaviors under conditions of environmental turbulence: The case of South Africa. J Business Ethics. 1996;15:1119-30.
95. Roussouw GT. Establishing moral business culture in newly formed democracies. J Business Ethics. 1998;17:1563-71.
96. Verschoor CC. A study of the link between a corporation's financial performance and its commitment to ethics. J Business Ethics. 1998;17:1509-16.
97. Judge WO. Correlates of organizational effectiveness: A multilevel analysis of a multi-dimensional outcome. J Business Ethics. 1994;13:1-10.
98. Zarkada-Fraser A. A classification of factors influencing participating in collusive tendering agreements. J Business Ethics. 2000;23:269-82.
99. Enderle G, Tavis LA. A balanced concept of the firm and the measurement of its long-term planning and performance. J Business Ethics. 1998;17:1124-44.
100. Koehn D. Can and should businesses be friends with one another and their stakeholders. J Business Ethics. 1998;17:1755-63.
101. Valenzuela JLD, Villaconta FS. The relationship between companies and their suppliers. J Business Ethics. 1999;22:273-80.
102. Jones MT. The institutional determinants of social responsibility. J Business Ethics. 1999;20:163-79.
103. Vitell S, Festervand TA. Business ethics: Conflicts, practices, and beliefs of industrial executives. J Business Ethics. 1987;6:111-22.
104. Dubinsky AJ, Ingram TN. Correlates of salespeople's ethical conflict: An exploratory investigation. J Business Ethics. 1984;3:343-53.
105. Dooley RS, Fryxell GE. Are conglomerates less environmentally responsible? An empirical examination of diversification strategy and subsidiary pollution in the U.S. chemical industry. J Business Ethics. 1999;21:1-14.
106. Reichers AE, Schneider B. Climate and culture: An evolution of constructs. In: Schneider B, ed. Organizational Climate and Culture. San Francisco, CA: Josey-Bass; 1990:5-39.
107. Sims RL, Keon TL. Determinants of ethical decision making: The relationship of the perceived organizational environment. J Business Ethics. 1999;20:393-404.
108. Agarwal J, Malloy DC. Ethical work climate decisions in a not-for-profit organization: An empirical study. J Business Ethics. 1999;20:1-14.
109. Vidader-Cohen D. Moral climate in business firms: A conceptual framework for the analysis of change. J Business Ethics. 1998;17:1211-26.
110. Key S. Organizational ethical culture: Real or imagined? J Business Ethics. 1999;20:217-25.
111. Argandona A. Sharing out in alliances: Trust and ethics. J Business Ethics. 1999;21:217-28.

112. Hartman SJ, Yrle AC, Galle WP. Procedural and distributive justice: Examining equity in a university setting. J Business Ethics. 1999;20:337-51.
113. Amabile TM, Griskiewicz N. The creative environment scale: The work environment inventory. Creativity Res J. 1989;2:231-54.
114. Gotterbarn D. Not all codes are created equal: The software engineering code of ethics, a success story. J Business Ethics. 1999;22:81-9.
115. Etheredge JM. The perceived role of ethics and social responsibility: An alternative scale structure. J Business Ethics. 1999;18:51-64.
116. Brierley JA, Cowton CJ. Putting meta-analysis to work: Accountants' organizational-professional conflict. J Business Ethics. 2000;24:343-53.