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Differences in Biases and Compensatory Strategies Across Discipline, Rank, and Gender among University Academics

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Abstract

The study of ethical behavior and ethical decision making is of increasing importance in many fields, and there is a growing literature addressing the issue. However, research examining differences in ethical decision making across fields and levels of experience is limited. In the present study, biases that undermine ethical decision making and compensatory strategies that may aid ethical decision making were identified in a series of interviews with 63 faculty members across six academic fields (e.g. biological sciences, health sciences, social sciences) and three levels of rank (assistant professor, associate professor, and full professor) as well as across gender. The degree to which certain biases and compensatory strategies were used in justifications for responses to ethical situations was compared across fields, level of experience, and gender. Major differences were found across fields for several biases and compensatory strategies, including biases and compensatory strategies related to use of professional field principles and field-specific guidelines. Furthermore, full professors tend to differ greatly from assistant and associate professors on a number of constructs, and there were differences in the consistency with which

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biases and compensatory strategies were displayed within these various groups. Implications of these findings for ethics training and future research are discussed.

Keywords

ethics; cross-field; biases; compensatory strategies; cross-rank; ethical decision making

The study of ethical behavior and ethical decision making is important to research in many fields (Ford & Richardson, 1994; Mumford, Murphy, Connelly, Devenport, Antes, Brown, Hill, & Waples, 2009). In recent years research on ethical behavior and ethical misconduct has provided a more complete understanding of ethical issues facing researchers. Specifically, up until the last 25–30 years it has been unclear what is even meant by terms such as "research ethics" and "responsible conduct of research." Research had been broadly separated into three categories: deliberate misconduct, fabrication/falsification/plagiarism, and questionable research practices (Steneck, 2006). There is a growing interest in ethical decision making in scientific fields with strong research components. This may be due to the increasing incidence and types of ethical misconduct violations occurring. A study by Martinson, Anderson, and de Vries (2005) suggested that ethical misconduct is more prominent than previously realized and more recently a tenfold increase in rate of retractions has been documented in the last decade across a number of notable science journals, with almost 50% attributable to researcher misconduct (Van Noorden, 2011).

Ethical decision making can be thought of in many ways, but the literature tends to regard ethical decision making as a process (Hunt & Vitell, 1986; Treviño, 1986; Butterfield, Treviño, & Weaver, 2000; Treviño, Weaver, & Reynolds, 2006). Rest (1986) proposed a model of ethical decision making featuring four distinct processes: 1) moral sensitivity, 2) moral judgment, 3) moral motivation, and 4) moral action. According to this model, a moral individual, or moral agent, first recognizes an ethical dilemma, makes a moral judgment about how to proceed, commits to choosing the moral option over alternative, and finally executes the decision. Jones (1991) added to Rest's (1986) model by suggesting each component of Rest's model is influenced by moral intensity.

Rest's (1986) initial work on ethical decision making as a process served as an impetus for further research on the proposition. In an attempt to understand ethical decision making in organizations, Treviño (1986) proposed a model featuring roles of both individual and situational variables. In this model, moral ethical or unethical behavior is a function of an individual's stage of cognitive moral development as well as individual (e.g. ego strength, locus of control) and situational (e.g. immediate job context, organizational culture) moderating factors. Treviño, Weaver, and Reynolds (2006) expounded on this model by examining the ethical decision-making process at the organization, group, and individual level.

Biases and Compensatory Strategies

Ethical decision making has also been examined with regard to factors that may influence the decision-making process. An individual's ability to make an ethical decision may be hindered by biases, which result from a combination of psychological and contextual variables. Much of the early work on biases and heuristics was done by Kahneman and colleagues (Kahneman & Tversky, 1977; Kahneman & Tversky, 1996; Tversky & Kahneman, 1981; Kahneman, Slovic, & Tversky, 1982). The focus of these papers was on the psychological principles influencing decision making and judgment, such as heuristics and biases. Along similar lines, Hogarth and colleagues (Hogarth, 1980, 1981; Kunreuther, Meyer, Zeckhauser, Slovic, Schwartz, Schade, Luce, Lippman, Krantz, Kahn, & Hogarth, 2002; Einhorn & Hogarth, 1981) examined factors that inhibit an individual's ability to process information rationally. These studies are not specific to ethical decision making; research has only recently begun examining the relationship between biases and ethical decision making.

A number of biases have been identified as influencing ethical decision making. For example, Detert, Trevino, and Switzer (2008) found that variables comprising moral disengagement (i.e. displacement of responsibility, diffusion of responsibility, distortion of consequences) positively predict unethical decision making. Similarly, Novicevic, Buckley, Harvey, and Fung (2008) showed that individuals who deflect accountability tend to make more unethical decisions. In a study examining high-stakes, low-probability settings, Kunreuther et al. (2002) found that naïve decision makers are particularly prone to a large variety of harmful biases, such as failing to recognize a high-stakes problem, ignoring important information, and a tendency to prefer the status quo. In a recent study, Medeiros, Mecca, Gibson, Giorgini, Mumford, Connelly, and Devenport (2014) examined the influence of biases on ethical decision making in an academic research context. Specifically, they identified nine of the most common biases exhibited by researchers across various fields, with a general theme involving liberating themselves from responsibility.

Though biases may be detrimental to ethical decision making, strategies have been identified that may help to compensate for such biases. Specifically, these compensatory strategies represent an approach to problem solving that may counteract biases and ultimately lead to more ethical decisions (Scott, Leritz, & Mumford, 2004; Thiel, Bagdasarov, Harkrider, Johnson, & Mumford, 2012). It has been shown that spending more time deliberating during decision making leads to more effective decisions, regardless of the nature of the problem (Moxley, Ericsson, Charness, & Krampe, 2012). In a recent study, Mecca, Medeiros, Giorgini, Gibson, Mumford, Connelly, and Devenport (2014) identified the most common strategies researchers employ to counteract biases that may hinder ethical decision making. Specifically, they found that researchers tend to turn to field guidelines, recognize a lack of necessary information, and respect boundaries when working through the decision-making process. Finally, the ethical decision making of leaders has been shown to improve through use of various strategies, such as emotional regulation, self-reflection, forecasting, and integration of information (Thiel, Bagdasarov, Harkrider, Johnson, & Mumford, 2012). The complex process of ethical decision making may be further explained by a sensemaking model (Mumford, Connelly, Brown, Murphy, Hill, Antes, Waples, & Devenport, 2008).

Sensemaking is an important component of ethical decision making (Sonenshein, 2007). Sensemaking refers to the process of making sense of a situation in its entirety, and primarily involves gathering information, comprehending some sort of meaning from the information, and implementing a decision. People use sensemaking to aid in making a decision when a situation is ambiguous and equivocal (Weick, 1995). Given the inherently ambiguous nature of situations calling for an ethical decision, Mumford et al. (2008) added to existing sensemaking models of ethical decision making. According to this model, when an individual is presented with an ethical problem, his or her initial appraisal of the situation is immediately influenced by a number of situation considerations (e.g. perceived causes of the situation, professional and personal goals, perceived requirements for attaining these goals, and professional codes of conduct and field guidelines). Next, the individual frames the problem into a general understanding of the situation (Tversky & Kahneman, 1974), and may experience certain emotional states as a result of the ethical dilemma (Haidt, 2001, 2003). Following framing of the problem, the individual develops a framework for the present situation by seeking prior experiences or cases that may be relevant. Consideration of prior experience provides individuals with knowledge about causes, outcomes, actions, constraints, and contingencies (Kolodner, 1997; Hammond, 1990). Using knowledge from prior experiences, individuals are now equipped with mental models that can be applied during decision making. They can then use these mental models to forecast a variety of outcomes or consequences of alternative actions. Due to the high-stakes nature of ethical scenarios, individuals tend to forecast outcomes in accordance with their views of themselves; i.e., it is an inherently self-reflective process. Taking into account the initial situational considerations, framing of the situation, emotions regarding the situation, prior professional and personal experiences, and forecasting possible outcomes, a decision is then made and acted upon. Because of the various factors that influence sensemaking, such as emotions, prior experiences, and consideration of codes of conduct and professional guidelines, one would expect differences in sensemaking strategies and subsequent ethical decision making across fields, position levels, and gender.

In two related studies, Medeiros et al. (2014) and Mecca et al. (2014) have identified the most common biases people exhibit and compensatory strategies people employ to counteract these biases. However, these studies focus solely on the frequency with which these biases and compensatory strategies occur, and the degree to which they occur. They provide an overview of which biases and compensatory strategies are most common for all researchers, but give no clues as to who is more likely to exhibit specific biases or compensatory strategies. In order to answer this question, in the present study, we will examine these biases and compensatory strategy variables as a function of field of study, academic rank, and gender.

In their study examining the effects of field with respect to ethical decision making, reasoning strategies, social-behavioral responses, and exposure to unethical events, Mumford et al. (2009) provided evidence that ethical decision making varies by field. This study of doctoral students in the biological, health, and social sciences demonstrated the existence of significant cross-field differences in ethical decision making, even when taking into account differences in personality and cognitive ability (Feist & Gorman, 1998). Additionally, differences across fields were found with regard to certain dimensions of ethical misconduct (Mumford et al., 2009). For example, health sciences students tended to score lower on data management issues but higher on issues involving study conduct, while biological sciences students scored lower on issues involving study conduct but higher scores on issues concerning data management.

Given the complex concept of fields in science (Csikszentmihalyi, 1999), field here refers to work in a particular domain to address specific problems. Conceptually, fields are characterized by three distinct attributes. In an effort to control the work being done, fields create institutional structures (Baer & Frese, 2003). Additionally, it is expected that individuals working within a field meet certain specified educational requirements (Sternberg, 2005). Finally, through institutionalization and experiences, fields impose a set of normative expectations on those working in a particular area (Feldman, 1999). Previous studies have indicated differences in ethical decision making across field but have lacked explanations for why these differences occur (Mumford et al., 2007; 2009). Differences in ethical decision making across field may be the result of different biases and compensatory strategies being used, and some may have more detrimental effects than others. The following research questions flow from these observations.

Research Question 1: Will certain biases be demonstrated to varying degrees by members of different academic fields?

Research Question 2: To what extent does the use of certain compensatory strategies vary across groups of related academic fields?

Research Question 3: Will certain fields demonstrate greater variability in exhibiting some biases and compensatory strategies when compared to other academic fields?

Field-Specific Guidelines

Each field has its own set of ethical guidelines, or principles (McCabe, Trevino, & Butterfield, 1996). Ford and Richardson's (1994) review of literature on ethical decision making showed inconsistent findings regarding the influence of codes of conduct on ethical behavior. This may be explained by the fact that specific organizations and institutions tend to vary widely with regard to the extent to which codes are enforced and the degree to which codes of conduct are considered a part of the organizational culture (Giorgini, Mecca, Gibson, Medeiros, Mumford, Connelly, & Devenport, in press). Additionally, within a field, there is a community of which all members are a part, with the assumption being that people are social beings driven to act in accordance with social norms. Every field of study has its own professional guidelines by which members are expected to abide, and it is expected that these guidelines differ in detail and content as a function of the nature and type of work being done in the particular field. Due to the varying nature of principles across fields, it is expected that the degree to which these principles are applied and misapplied will vary across field, and thus we present the following research questions.

Research Question 4a: Does the degree to which principles are misapplied differ significantly across academic fields?

Research Question 4b: Does the degree to which scientific principles are applied differ significantly across academic fields?

Academic Rank and Ethical Decision Making

Field of study is but one of many factors thought to influence ethical decision making. That is, it is one of many potential variables that may have an impact or alter in an individual's ethical decision making process. Level of experience is commonly assumed to be another influence of ethical behavior and ethical decision making (Mumford et al., 2009). As one does more work in a field, he or she acquires more skills and knowledge regarding strategies for resolving ethical problems (Ericsson & Charness, 1994). Utilization of this knowledge, combined with adherence to field norms, may potentially lead to improved ethical decision making and ethical behavior. Research on experience level and ethical decision making, however, has been mixed (Ford & Richardson, 1994; O'Fallon & Butterfield, 2005). In some situations, more experience leads to more ethical behavior, while sometimes it leads to less ethical behavior. For example, in their review of the empirical literature on ethical decision making, Ford and Richardson (1994) identified nine studies examining ethical decision making as a function of employment position or experience level. Of these nine studies, three indicated more experienced people are more ethical, and six found no significant differences. In a study examining ethicality of salespeople, Dubinsky and Ingram (1984) found no relationship between job tenure and ethical behavior. Contrastingly, Chavez, Wiggins, and Yolas (2001) found that tenure length of CEOs is negatively related to ethical decision making, perhaps because their stakes are high. Overall, it appears that type and years of employment are related to ethical decision making behavior in some, but not all, situations.

Professional expertise has a pervasive influence on performance and behavior (Ericsson & Charness, 1994; Weisberg, 1999). Expertise is not merely the accumulation of knowledge, but refers to a display of consistent superior performance on a set of domain-specific tasks. One factor that has been shown to contribute to acquisition of professional expertise is exposure to unethical events (Weisberg, 2006; Ericsson & Charness, 1994). Exposure to unethical events is likely to increase with experience. That is, as an individual spends more time working in a field, he or she is likely to have more experiences, some of which include situations involving ethical elements. Similarly, exposure to unethical events has been shown to exert stronger influence on less experienced students than more experienced students (Mumford et al., 2009). Additionally, people are more likely to apply relevant case models as expertise increases (Kolodner, 1997; Mumford et al., 2009). The influence of experience level on ethical decision making can be further explained by a sensemaking model.

According to the sensemaking model of ethical decision making described earlier (Mumford et al., 2008), a number of factors influence sensemaking and subsequent decision making. Some of these factors, such as prior personal and professional experience, framing, and perceptions of the situation will vary as a function of level of experience. For example, full professors have more prior professional experiences than assistant professors, and thus individuals at these professional levels are likely to perceive situations differently, from a different perspective and mindset, and frame situations accordingly. As a result, it is expected that individuals with varying levels of experience will exhibit different patterns of biases and compensatory strategies. These observations lead to the following research questions.

Research Question 5: How does the pattern of biases and compensatory strategies in justifications of responses to ethical situations differ across level of experience?

Research Question 6: Will certain levels of experience (academic ranks) demonstrate greater variability in exhibiting certain biases and compensatory strategies than other levels?

Gender and Ethical Decision Making

The role of gender in ethical decision making has received substantial attention (Loe, Ferrell, & Mansfield, 2000; O'Fallon & Butterfield, 2005; Kish-Gephart, Harrison, & Trevino, 2010; Flanagan & Jackson, 1987). Results regarding gender differences in ethical decision making and ethical behavior tend to be mixed. Many studies show females to be more ethical than males (Ruegger & King, 1992; Kelley, Ferrell, & Skinner, 1990; Dawson, 1992; Barnett & Karson, 1989; Betz, O'Connell, & Shepard, 1989; Ross & Robertson, 2003; Glover, Bumpus, Logan, & Ciesla, 1997). Alternatively, other studies have failed to demonstrate significant gender differences in ethical behavior (Dubinsky & Levy, 1985; McNichols & Zimmerer, 1985; Serwinek, 1992; Browning & Zabriskie, 1983; Brady & Wheeler, 1996). In a review of empirical literature on ethical decision making, Ford and Richardson (1994) examined 13 studies investigating the influence of gender on ethical behavior. Of these 13 studies, eight demonstrate no significant differences between males and females with regard to ethical decision making or ethical behavior. It should be noted, however, that no studies examined in either Ford and Richardson's (1994) or O'Fallon and Butterfield's (2005) reviews of the ethical decision-making literature showed males as being more ethical than females. Gender differences have been found with regard to variables related to ethical decision making. Specifically, females have shown a higher level of moral orientation (Yankelovich, 1972; Gilligan, 1982), less concern for money (Betz & O'Connell, 1989), and greater awareness of moral development context (Borkowski & Ugras, 1998). Given the overall theme of the literature, it is expected that females may demonstrate significantly less use of some biases, and more use of compensatory strategies, than males.

Research Question 7: Do females demonstrate less bias in justifications of responses to ethical responses than males?

Research Question 8: Do females demonstrate greater use of compensatory strategies in justifications of responses to ethical situations than males?

Method

A preliminary list of the biases and compensatory strategies likely to influence ethical decision making in research was developed by Antes, Caughron, and Mumford (2010) on the basis of a measure of ethical decision making (Mumford, Devenport, Brown, Connelly, Murphy, Hill, & Antes, 2006). The list of biases and compensatory strategies can be found in Table 1 and Table 2. The present study was conducted in two phases. An abridged description of the method is described here, and a more detailed explanation of the method can be found in Medeiros, Mecca, Gibson, Giorgini, Mumford, Connelly, and Devenport (2014) and Mecca, Medeiros, Giorgini, Gibson, Mumford, Connelly, and Devenport (2014).

Think-Aloud Protocol Interviews

The sample of this study consisted of 64 faculty members at a large southwestern university. Of these 64, 37 were male and 27 were female. Additionally, 15 faculty members were assistant professors, 28 faculty members were associate professors, and 20 faculty members were full professors. Professors were recruited from six areas comprised of related fields of study: performance (e.g. drama, theatre, architecture)(n = 10), biological sciences (botany, biochemistry)(n = 6), health sciences (medicine, dentistry)(n = 22), humanities (history of science, philosophy)(n = 5), physical sciences (engineering, geology)(n = 7), and social sciences (sociology, economics)(n = 14) through a faculty liaison asking for faculty volunteers for a study of ethical decision making.

Participants were sent emails with links to an ethical decision-making instrument (Mumford et al., 2009) and asked to complete a version that corresponded to his or her area of study (e.g. performance, biological sciences, health sciences, humanities, physical sciences, and social sciences). These instruments were developed after review of codes of conduct within each respective field. These area-specific measures differ only in their field-specific content but tap the same ethical dimensions discussed above. From this review, four general dimensions of ethical behavior in the sciences were identified (e.g. data management, study content, professional practices, and business practices), with 17 additional dimensions being subsumed under the four general dimensions. Evidence of similarity and construct validation for these measures was provided by Mumford et al. (2006).

Each ethical decision-making instrument featured between four and seven scenarios including approximately five questions each. These instruments were designed to be similar and parallel across fields. Participants were told to select two answers to each question. Each answer was preidentified as a low, medium, or high response during instrument design, with high answers indicating the best solutions to the ethical dilemmas, and low answers indicating the worst solutions. Participants received a score for each scenario as well as an overall score on the ethical decision making measure, based on their responses. An idiographic approach was utilized to identify scenarios in which participants were likely to have engaged in biases or compensatory strategies in their ethical decision-making process. First, each individual’s mean score for the measure was calculated. Then, scenarios on which participants scored at least a half standard deviation above or below their means were identified as potentially influenced by bias or compensatory strategies.

Following a one-to-two-week lag period, participants participated in a think-aloud protocol interview in which they were asked questions regarding their reasoning for selecting their answers on scenarios which may have been influenced by biases or compensatory strategies. Four interviewers, industrial/organizational psychology doctoral students familiar with the ethical decision-making literature, carried out the interviews. They were blind to each participant’s scores on each item. That is, interviewers only knew the scenarios about which to ask, but did not know whether the participant had scored high or low for any item included in the scenario. Interviews were recorded and transcribed.

Benchmark Ratings

The next phase of the study involved rating the interviews for biases and compensatory strategies. Rating scales were developed in accordance with extant biases and compensatory strategies developed by Antes, Caughron, and Mumford (2010). The preliminary list of biases and compensatory strategies was expanded to include additional biases and compensatory strategies identified during the interview process. In total, the list was comprised of 18 biases and 15 compensatory strategies. Biases and compensatory strategies were rated on a scale of 1 to 5, representing the degree to which a participant displayed each bias or compensatory strategy. Specifically, a score of 1 indicated that a bias or compensatory strategy was not at all apparent, and a score of 5 indicates that a particular bias or compensatory strategy was exhibited multiple times and/or to a great extent.

Judges familiar with the ethical decision-making literature, the same judges who conducted the think-aloud interviews, were trained on operational definitions and rating scales, then rated each bias and compensatory strategy. The same judges rated a sample of transcribed interviews and met to discuss disagreements and discrepancies in their ratings. The process repeated until ratings of each construct demonstrated adequate reliability. Following this process, inter-rater agreement coefficients averaged $r_{wg}* = .83$ for biases and $r_{wg}* = .79$ for compensatory strategies.

Analyses

Means, standard deviations, and homogeneity of variances were determined for each bias and compensatory strategy for each discipline, academic rank, and gender. Mean difference scores scaled in standard deviations were obtained for each variable across field, level, and gender. Specifically, each average group score was compared to the grand mean of all groups for that particular variable. For example, the average score of biological sciences for the Abdication of Responsibility bias was compared to the grand mean of all fields for Abdication of Responsibility. These differences were scaled in terms of standard deviations. A mean difference of .50 standard deviations was used as a cutoff for differences between fields, and a .25 standard deviation cutoff was used for differences between rank. Additionally, t-tests were used to compare the mean of each field to an aggregated mean of all other fields for each bias and compensatory strategy variable. This process was repeated for experience level, but not for gender as gender only consisted of two groups, making aggregation unnecessary. Finally, homogeneities of variances were examined across fields, ranks, and gender. When variances differed significantly across groups for a certain variable, pairwise Levene's tests were conducted on all groups to isolate the source of the violation of homogeneity of variance. That is, it was determined which groups, specifically, differed from each other in the degree to which they vary. This may be of relevance for a number of reasons. First, we want to make sure our tests are fulfilling statistical assumptions, so homogeneity of variance is tested for. Finally, there may be implications for training interventions regarding variability. For example, if a field or rank demonstrates high/low variability on a certain bias, the training intervention can be adjusted accordingly for that specific field or rank.

Given the number of comparisons, the size of tables prohibits their presentation. Full tables are available upon request.

Results

Benchmark Rating System

Information regarding intercorrelations among biases and compensatory strategies as scored using the benchmark rating system described above can be found in Mecca et al. (2014) and Medeiros et al. (2014). Construct validity evidence is available for this rating system, as biases and compensatory strategies were correlated with each other in a fashion that one might expect. For example, Self-Justification was positively related to both Illusion of Control ($r = .42$) and Moral Insensitivity ($r = .38$). Similarly, Monitoring Assumptions was positively related to both Maintaining Objective Focus ($r = .35$) and Self-Accountability ($r = .37$).

Cross-Field Comparisons

There were field differences in the use of certain biases and compensatory strategies. Means and standard deviations of the biases and compensatory strategies for each field can be found in Tables 3 and 4. Overall, individuals in performance and biological sciences fields tended to exhibit biases less than individuals in other fields. Compared to the aggregated means of other groups, performance fields exhibited less-than-average display of 12 of the 18 biases. Specifically, individuals in performance fields demonstrated significantly less use of Changing Standards and Norms, $t(63) = -2.20$, $p < .05$, Diffusion of Responsibility, $t(63) = -2.30$, $p < .05$, Misapplication of Principles, $t(63) = -3.57$, $p <.05$, and Naiveté, $t(63) = -2.13$, $p < .05$. Performance fields demonstrated less use of compensatory strategies as well. Of the 15 compensatory strategies, performances scored lower than average on nine of them. Performance exhibited significantly less use of the Attending to Scientific Principles, $t(63) = -3.77$, $p < .01$, Recognition of Insufficient Information, $t(63) = -2.35$, $p < .05$, and Strategy Selection, $t(63) = -2.82$, $p < .01$ compensatory strategies.

When compared to other fields, biological sciences exhibited less than average use of 13 of 18 biases. Specifically, individuals in biological sciences showed significantly less of the Forcing a Decision, $t(63) = -3.31$, $p < .01$, Framing, $t(63) = -3.64$, $p < .01$, Maintaining the Status Quo, $t(63) = -2.89$, $p < .05$, and Unwarranted Compromise, $t(63) = -2.65$, $p < .05$ biases. Perhaps more noteworthy, individuals in biological sciences tended to use fewer compensatory strategies than other fields. In fact, biological sciences demonstrated less than average use of 10 of the 15 compensatory strategies.

When comparing each field to the aggregated other fields using t-tests, there were significant differences across fields for 10 of the 18 biases. This provides affirmative support for Research Question 1, which pondered whether the extent to which certain biases are exhibited would vary across field. These cross-field differences occurred for the following biases: Abdication of Responsibility, Changing Standards and Norms, Diffusion of Responsibility, Forcing a Decision, Framing, Maintaining the Status Quo, Misapplication of Principles, Naiveté, Self-Handicapping, and Unwarranted Compromise. Analysis of variance tests showed four biases for which there were at least two fields differing from each other: Diffusion of Responsibility (F (63) = 2.43, $p < .05$), Forcing a Decision (F (63) = 4.88, $p < .01$), Misapplication of Principles (F (63) = 7.73, $p < .01$), and Unwarranted Compromise (F (63) = 3.37, $p < .05$).

When comparing each field to the aggregated other fields using t-tests, cross-field differences were found for seven of the 15 compensatory strategies. This finding provides affirmative support for Research Question 2, which questioned whether the extent to which certain compensatory strategies are exhibited would vary across field. These cross-field differences occurred for the following compensatory strategies: Attending to Scientific Principles, Deliberative Action, Following Appropriate Role Models, Recognition of Insufficient Information, Recognizing Boundaries, Strategy Selection, and Striving for Transparency. Analysis of variance tests showed three compensatory strategies for which there were at least two fields differing from each other: Attending to Scientific Principles (F (63) = 3.44, $p < .01$), Recognizing Boundaries (F (63) = 3.45, $p < .01$), Striving for Transparency (F (63) = 3.11, $p < .05$).

Variability differences across fields were significant for several biases and compensatory strategies. That is, for certain biases and compensatory strategies, some fields displayed more or less variability in the degree to which these biases and compensatory strategies were exhibited. Variables for which the homogeneity of variance assumption was violated were examined more closely in order to isolate the paired fields causing the violation. Changing Standards and Norms ($p < .01$) demonstrated significant differences in variability across groups. Closer inspection reveals the differences to be caused by comparisons of performance fields to biological sciences, with biological sciences displaying more variability ($p < .05$), performance fields to humanities, with humanities displaying more variability ($p < .05$), biological sciences to social sciences, with biological sciences displaying more variability ($p < .01$), and humanities to social sciences, with humanities displaying more variability ($p < .01$). Moral insensitivity also demonstrated significant differences in variability across groups ($p < .05$). These differences stem from the performances to physical sciences ($p < .05$) and physical to social sciences ($p < .01$) comparisons, with physical sciences displaying more variability in each case. Another bias demonstrating significant variability differences across field is Naiveté ($p < .05$). These differences are due to health sciences displaying more variable than social sciences ($p < .05$), performances ($p < .05$), and physical sciences ($p < .05$). Cross-field variability differences for Self-Justification ($p < .05$) are accounted for by humanities displaying more variability than performances ($p < .01$), biological sciences ($p < .01$), health sciences ($p < .05$), and social sciences ($p < .05$). Unquestioning Deference to Authority showed significant cross-field variability differences ($p < .01$) caused by humanities showing significantly more variability than physical sciences ($p < .01$), biological sciences ($p < .01$), performance ($p < .01$), and social sciences ($p < .01$), as well as performance showing more variability than social sciences ($p < .05$). Differences in variability across field for Unwarranted Compromise ($p < .01$) were the result of significant differences for biological sciences to social sciences, with social sciences showing more variability ($p < .01$), and humanities to biological sciences, physical sciences, social sciences, performance, and health sciences, with humanities showing more variability than all other fields (*p* < .01). The final bias demonstrating significant cross-field differences in variability was Willful Ignorance. Further examination found the differences to be isolated to performances to biological sciences, with biological sciences being more variable (*p* < .05), biological sciences to health sciences, with biological sciences being more variable (*p* < .05), humanities to social sciences, with humanities being more variable (*p* < .05), biological sciences to physical sciences, with biological sciences being more variable (*p* < .01), and biological sciences to social sciences, with biological sciences being more variable (*p* < .01). In total, seven biases demonstrated significant variability differences across field.

In addition to cross-field variability differences for biases, cross-field differences in variability were also found for several compensatory strategies. Deliberative Action demonstrated significant differences in variability (*p* < .05) across field. Closer examination reveals the differences to be the result of humanities showing more variability than biological sciences (*p* < .05) and health sciences (*p* < .05), and biological sciences showing significantly less variability than social sciences (*p* < .01), performance (*p* < .05), and health sciences (*p* < .05). Cross-field variability differences for Following Appropriate Role Models (*p* < .05) are accounted for by differences between performances and biological sciences, (*p* < .01), performances and health sciences (*p* < .01), performances and humanities (*p* < .01), and performances and physical sciences (*p* < .01), with performances displaying more variation than all four fields, humanities and social sciences, with humanities showing more variation (*p* < .05). Differences in variability across field for Monitoring Assumptions (*p* < .05) are due to the humanities showing more variability than physical sciences (*p* < .05), social sciences (*p* < .05), and health sciences (*p* < .01). Finally, significant cross-field differences in variability for Selective Engagement (*p* < .05) was due to health sciences displaying more variability than physical sciences (*p* < .05) and biological sciences (p < .05). In total, four compensatory strategies demonstrated significant differences in variability across field. Cross-field differences in variability for seven biases and four compensatory strategies provide an answer for Research Question 3, which asked whether certain fields will demonstrate greater variability in use of some biases and compensatory strategies than other fields.

Of particular note are the significant cross-field differences for the Misapplication of Principles bias and Attending to Scientific Principles compensatory strategy. Individuals in performance, $t(63) = -3.573$, $p < .01$and social sciences, $t(63) = -2.70$, $p < .01$ fields misapplied principles the least, while individuals in the physical sciences, $t(63) = 3.44$, $p < .05$, misapplied principles the most. Similarly, individuals in the performance fields attended to scientific principles the least, $t(63) = -3.77$, $p < .01$, while individuals in the biological sciences (mean difference of .65 standard deviations) and humanities (mean difference of 1.08 standard deviations) attended to scientific principles more than individuals of other fields. These findings provide support for Research Questions 4a and 4b, which questioned whether significant differences would be exhibited for Misapplication of Principles and Attending to Scientific Principles across fields.

Cross-Rank Comparisons

In addition to observed differences across field, there were also differences in the influence of biases and use of compensatory strategies across academic ranks. Independent samples t-tests comparing each rank to the aggregate of other ranks revealed three significant differences. First, full faculty members displayed significantly less Willful Ignorance, $t(63) = -4.01$, $p < .01$ than assistant and associate professors. Along similar lines, full professors demonstrated less Naiveté, $t(63) = -1.92$, $p = .06$ than assistant and associate professors. Finally, associate professors demonstrated less use of the Monitoring Assumptions strategy, $t(63) = -2.37$, $p < .05$ than assistant and full professors.

When examining mean differences between ranks scaled in standard deviations, more effects emerge. Using a .25 standard deviation cutoff, assistant professors were shown to exhibit significantly more of the following biases when compared to associate and full professors: Framing (mean difference of .26 standard deviations), Illusion of Control (mean difference of .32 standard deviations), Self-Justification (mean difference of .31 standard deviations), and Willful Ignorance (mean difference of .32 standard deviations). In congruence with the t-tests, associate professors showed relatively average display of biases, with only Maintaining the Status Quo (mean difference of .27 standard deviations) being exhibited less than other professors. Finally, full professors showed significantly less use of Naiveté (mean difference of .42 standard deviations), Unwarranted Compromise (mean difference of .31 standard deviations), and Willful Ignorance (mean difference of 1.06 standard deviations).

An examination of differences across level scaled in standard deviations for compensatory strategies similarly showed more effects. Using the same .25 standard deviation cutoff as for biases, assistant professors were shown to utilize the Monitoring Assumptions (mean difference of .32 standard deviations) and Selective Engagement (mean difference of .26 standard deviations) compensatory strategies to greater extent than their more experienced counterparts, while demonstrating less use of the Strategy Selection (mean difference of .37 standard deviations) and Value/Norm Assessment (mean difference of .26 standard deviations) compensatory strategies. In the other direction, associate professors demonstrated more use of Monitoring Assumptions (mean difference of .48 standard deviations) and Selective Engagement (mean difference of .26 standard deviations) when compared to assistant and full professors. Finally, full professors did not demonstrate the Striving for Transparency (mean difference of .31 standard deviations) compensatory strategy, when compared to their less experienced counterparts. The previously discussed findings lend support for Research Question 5, which questioned whether the use of certain biases and compensatory strategies would differ across level of experience, or academic rank.

Variability differences across ranks were significant for several biases and compensatory strategies. In other words, for certain biases and compensatory strategies, some academic ranks showed more variability than others. Biases and compensatory strategies for which the homogeneity of variance assumption was violated were inspected further in order to isolate the source of the violation. No differences in variability were found between assistant professors and associate professors with regard to biases. Comparisons of assistant professors and full professors indicated that assistants were more inconsistent in their display of Naiveté ($p < .05$) and Willful Ignorance ($p < .01$). Compared to associate professors, full professors showed more variability in their exhibition of Willful Ignorance ($p < .01$).

Cross-level variability differences were more diverse for compensatory strategies than for biases. Assistant professors showed more variability than associates in their use of Monitoring Assumptions ($p < .01$), but less variability than associates in Recognition of Insufficient Information ($p < .01$). Compared to assistant professors, full professors showed significantly more variability in their use of the Deliberative Action (p < .01) and Recognition of Insufficient Information ($p < .05$) compensatory strategies, but displayed Striving for Transparency significantly less ($p < .05$). Overall, full professors tended to exhibit more variability with regard to use of compensatory strategies. Additionally, assistant professors tend to show more consistency with regard to both biases and compensatory strategies. Taken together, these findings provide support for Research Question 6, which asked whether certain academic ranks would demonstrate greater variability in use of certain biases and compensatory strategies when compared to other ranks.

Cross-Gender Comparisons

Only a few differences were found across gender for several biases, with female participants exhibiting less bias in each significant case. That is, every time there was a significant difference between males and females, it was always because females were exhibiting less bias, and the inverse was never true Females tended to display less False Consensus, $t(63) = 2.11$, $p < .05$, less Forcing a Decision, $t(63) = 1.75$, $p < .10$, and less Willful Ignorance, $t(63) = 1.98$, $p < .10$ than males. No significant differences were found between males and females regarding use of compensatory strategies during ethical decision making. These findings partially answer Research Question 7, which asked whether women would display less bias than men when making ethical decisions. With regard to Research Question 8, women were not found to exhibit greater use of compensatory strategies in justifications of responses to ethical situations than males.

Though few differences were found between men and women with regard to use of biases and compensatory strategies, more information can be gleaned by examining differences in variability. With regard to every bias but Willful Ignorance, males showed more variability than women. More specifically, males showed significantly more variability in their display of Forcing a Decision, $p < .05$, and Maintaining the Status Quo, $p < .05$. As for compensatory strategies, males showed more variability in their use of Deliberative Action, $p < .05$. On the other hand, females showed more variability than males in their use of the Following Appropriate Role Models, $p < .01$ and Recognizing Boundaries, $p < .05$ compensatory strategies. The implications of these findings are discussed below.

Discussion

Before turning to the implications of this study, several limitations should be noted. First, the sample used in this study consisted of faculty members carrying doctoral degrees in their respective fields. Thus, the results of this study may not generalize to other populations, such as businesses or other nonacademic settings. However, the purpose of this study was to determine differences in ethical decision making across fields and experience levels with regard to research practices. Thus, using a sample of faculty members engaged in research makes the sample particularly useful and representative for our purposes. Additionally, the low-fidelity nature of the task completed by participants may not generalize to real-world situations. For example, a particular individual's ethical decision-making process while completing an online measure may be different from their ethical decision-making process when confronted with a real-life situation involving an ethical dilemma. Nonetheless, the low-fidelity nature of this study is both appropriate and necessary given the potentially realistic nature of the content involving ethical dilemmas, especially when considering the prevalence of such ethical dilemmas in the research fields represented in this study.

When designating a participant's performance as either high or low for a particular scenario, indicating the presence of bias or compensatory strategies, a one-half standard deviation cutoff was used. Other cutoff scores could have been justified and may have been more appropriate. However, due to the nature of the measures, a smaller standard deviation cut off score may have included too many scenarios, whereas a larger standard deviation cutoff score may not have identified any relevant scenarios (Medeiros et al., 2014; Mecca et al., 2014). Similarly, cutoff scores of one-half standard deviation and one-quarter standard deviation were used as significance cutoffs in analyses of differences between means for field and level, respectively. Other cutoff scores could have been justified and may have provided different interpretations.

Though additional biases and compensatory strategies were iteratively added to the preliminary list established by Antes, Caughron, and Mumford (2010), there could be additional biases and compensatory strategies exhibited by researchers that have yet to be noticed or studied. In addition, other fields beyond the six included in this study could be examined, such as athletic fields (e.g. kinesiology).

This study examined differences in ethical decision making across field, rank, and gender. It may have been interesting to examine differences across a number of other variables, such as personality, thinking styles, or critical thinking skills. Similarly, a number of other variables could have hypothetically been included, such as religion, age, or country or origin. However, this would have greatly expanded the scope of the present study. Perhaps inclusion of covariates would have sufficed.

Finally, although the present study featured a modest sample of 64 faculty member participants, some fields featured small sample sizes. Specifically, the small sample sizes of humanities (n=5), biological sciences (n=6), and physical sciences (n=7) make some comparisons less meaningful. All analyses took differential sample sizes into account, but the small sample sizes of these three groups results in making inferences more difficult.

Despite these limitations, the findings of this study shed light on field, academic rank, and gender differences in ethical decision making. We know that ethical decision making varies across field (Baer, 2003; Mumford et al., 2009; National Institute of Medicine, 2002), but little indication has been given as to why these differences occur. Due to the seriousness and potential ramifications of unethical behavior, it is important to determine what mechanisms are driving these cross-field differences in ethical decision making. These differences can perhaps be explained by the varying exhibition and use of biases and compensatory strategies across fields, academic rank, and gender.

The results flowing from this study indicate that different fields exhibit certain biases and compensatory strategies to varying degrees. In reviewing the data, several patterns, or trends, emerge regarding use of biases and compensatory strategies in ethical decision making across fields. First, individuals in performance fields tend to use guidelines less than individuals in the more scientific fields. Additionally, individuals in performance fields tend to favor compensatory strategies that involve painting themselves in a positive light in the eyes of other people. For example, performance professors strive for transparency, meaning they attempt to maintain transparency throughout the ethical decision-making process, and prefer to make information available to others when working through a problem rather than keep it to themselves. Similarly, individuals in performances tend to take accountability for their actions and follow appropriate role models.

Individuals in health sciences tend to understand the importance of recognizing boundaries more than those in other fields. This may be due to the high-stakes nature of professions within the field (Lidz, 2006) and the competitive pressure associated with individuals working in the health sciences (Mumford et al., 2009; Robertson & Rymon, 2001). Considering these pressures have been shown to negatively influence ethical decision making (Mumford, Murphy, Connelly, Hill, Antes, Brown, & Devenport, 2007; Robertson & Rymon; 2001), and given the findings of Mumford et al. (2009) indicating ethical decision making being lower in health sciences than in biological sciences and social sciences, one might expect health science individuals to be more susceptible to biases in ethical decision making. However, this was not the case. In fact, individuals in health sciences were influenced by biases to about the same degree as were other fields on average, exhibiting only one bias, Abdication of Responsibility, more than other fields. Employees in the health sciences may be more prone to abdicate responsibility due to the high-risk nature of the job and the potential harmful ramifications of their actions. Additionally, hierarchical authority structures within hospitals are historically problematic for doctors (Christakis & Feudtner, 1993; James, 2000), further motivating medical doctors to abstain from accepting responsibility for actions that may cause them trouble.

Consistent with previous research in the health science field (Christakis & Feudtner, 1993; James, 2000; Minkler, 1993) indicating varying degrees of knowledge of employees within the field, the present study found health sciences to show significantly more variability in Naiveté than social sciences, physical sciences, and performance fields. On average, however, health sciences individuals do not appear to be naïve. Instead, some individuals in health sciences tend to be very naïve, while others tend to demonstrate much mindfulness.

This marked variability may be due to the diverse nature of professions within the field (e.g. work in hospitals, teaching, certain specialties).

Another trend emerging from the findings of the present study involves individuals in physical sciences. Overall, individuals working in physical sciences fields do not diffuse responsibility or self-handicap. That is, they accept responsibility for their actions and do not seek to displace blame onto others. Similarly, individuals in physical sciences do not defer to authority when confronted with an ethical issue, nor do they follow appropriate models. Additionally, they tend to take on more work than they should and fail to recognize the boundaries of their abilities and responsibilities. These results are in accordance with the stereotype that individuals in the physical sciences are highly independent and tend to work alone.

Finally, there is significant variability in the use of field-relevant principles across field. Individuals in the physical sciences misapply principles more so than the other fields examined here while those in the social sciences and performance fields tend to apply principles appropriately, or at least not incorrectly. This may be explained by the quality and clarity differences of norms, expectations, and guidelines set in each field (Helton-Fauth, Gaddis, Scott, Mumford, Devenport, Connelly, & Brown, 2003). Given that different organizations stress ethical culture to varying degrees (England, 1978; Barnett & Karson, 1989; Carroll, 1978; & Johnson, Neelankavil, & Jadhav, 1986), it is not surprising that some individuals apply the principles of the field more appropriately than others. Additionally, professions are self-policing (Bruhn, Zajac, Al-Kazemi, & Prescott, 2002), governed by the norms, regulations, and codes of conduct set by particular organizations within a field. According to Jamal and Bowie (1995), professional codes of conduct have traditionally failed to provide a framework capable of facilitating moral behavior. Given all of the above, the finding that use of field-relevant principles and following of guidelines differs across field is not a surprising one.

The present study also examined the biases and compensatory strategies across experience, or position, level. Biases and compensatory strategies were found to be demonstrated to varying degrees across level. One of the overarching trends regarding differences across academic ranks concerns the general tendency of full faculty members to display more variability with regard to the extent to which their ethical decision making is influenced by biases and compensatory strategies. This can perhaps be partly explained by the fact that a given sample of full professors includes individuals who have recently achieved the rank of full professors, as well as individuals who have been full professors for an extended period of time. This wide range of experience indicates varying degrees of expertise and prior experiences from which to draw when working through an ethical dilemma. Full professors do not exhibit ignorance and are less naïve than assistant professors and associate professors. Similarly, full professors are less prone to compromising in situations where compromise would be inappropriate. That is, they tend to know when they are right and will adhere to the decision they feel is appropriate. These trends indicate full professors have more expertise, which has been shown to improve problem solving (Finke, Ward, & Smith, 1992; Weisberg & Haas, 2007), and thus are more sure of themselves; they know what they are doing and are likely less afraid of negative repercussions due to their position in the academic hierarchy. Overall, full professors tend to display more variability and less consistency in their susceptibility to biases and use of compensatory strategies than other academic ranks, but not necessarily more ethicality. It is possible that some individuals learn the right lessons from experience while others learn the wrong lessons from experience and become less ethical over time.

There were very few significant differences in the degree to which biases and compensatory strategies were exhibited across gender. These findings are consistent with a majority of the literature examining the influence of gender on ethical decision making and ethical behavior (Jaffey & Hyde, 2000; Ford & Richardson, 1994; O'Fallon & Butterfield, 2005). There was a slight trend of women being less influenced by biases during ethical decision making; however, overall, women and men are similar in the degree to which their ethical decision making is influenced by biases and compensatory strategies. These findings are of note because they indicate that influence of biases and compensatory strategies do not account for the observed gender differences in ethical behavior and ethical decision making.

Instead, there must be other factors influencing gender differences in ethical decision making. This can possibly be explained by the types of situations males and females face. In a study examining ethics in a management context, Chonko and Hunt (1985) found that males saw fewer ethical problems than females, although this may be less true in modern society. Similarly, Keyton and Rhodes (1997) found that females are better able to identify ethical issues in a situation, such as cues of sexual harassment. Gender differences in ethical decision making may be further explained by the sensemaking model described earlier (Mumford et al., 2008).

Two of the key factors contributing to the sensemaking process are prior professional experience and prior personal experience. Despite the progression and diversification of the workplace, men and women still experience the workplace very differently and tend to have different jobs (Anker, 1998; Bertrand & Hallock, 2001; Booth & Nolen, 2012; Bertrand, Goldin, & Katz, 2010; Reuben, Rey-Biel, Sapienza, & Zinglas, 2012; Huang & Kisgen, 2013). Because of this, men and women have different prior personal experiences from which to make mental models of ethical decision making. Another key component of the sensemaking model is the effect of emotions on the sensemaking process, and, ultimately, a decision. Women tend to exhibit a wider range and intensity of emotions than men (Allen & Haccoun, 1976; Diener, Sandvik, & Larsen, 1985, Fujita, Diener, & Sandvik, 1991; Sprecher & Sedikides, 1993; Brody, 1985; Levenson, Carstensen, & Gottman, 1994). This difference in emotionality may influence the overall sensemaking process, thus influencing the final decision. When applied to situations involving ethical dilemmas, emotions may play a particularly powerful role.

Some trends regarding males and females emerge when examining differences in variability for certain biases and compensatory strategies. For example, men vary greatly on the degree to which they force decisions. In other words, some men force decisions and other men do not. This discrepancy may be a function of their environment. It may also be partially explained by their personality characteristics, such as conscientiousness. Similarly, some men are more authoritarian while others are more diplomatic. Again, this could be partially explained by differences in environment as well as personality characteristics. Finally, males do not vary in their tendency to follow appropriate models; they consistently do not follow appropriate role models. Females, on the other hand vary greatly in the degree to which they follow appropriate role models. This may be due to the underrepresentation of females in some scientific fields and positions of power (Oakley, 2000), and the resultant lack of female role models to follow.

Overall, this study adds to the ethical decision making literature in a number of ways. It has previously been established that cross-field differences in ethical decision making and ethical behavior exist. However, the present study seeks to determine relevant factors that may help to explain these differences. Specifically, the present study examines additional factors influencing cross-field, cross-level, and cross-gender differences in ethical decision-making behavior that have not previously been investigated. First, we examined the influence of biases on ethical decision making and determined that significant differences exist across field, level, and gender. We also examined the influence of compensatory strategies on ethical decision making and found that, as with biases, consideration of compensatory strategies play a role in the differences in ethical decision making found across field and level. Biases and compensatory strategies did not, however, explain gender differences in ethical decision making and ethical behavior that have been established in through research (Ford & Richardson, 1994; O'Fallon & Butterfield, 2005). Instead, we propose that other factors, perhaps components of the sensemaking model, may play a more critical role in the explanation of gender differences in ethical decision making. The results and findings of this study may have implications for use in ethics training programs. For example, it may prove beneficial to train individuals on biases and bias management, as well as compensatory strategies and how to utilize them effectively. Future research may seek to examine more closely how the sensemaking model applies ethical decision making with regard to differences across field, level, and gender. Additionally, if employed in an ethics training context, future research may examine the effectiveness of inclusion of training blocks emphasizing biases and compensatory strategies.

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Table 1

Complete List of Biases

Bias	Operational Definition
Abdication of Responsibility	Inability to take responsibility for an ethical problem
Changing Norms and Standards	Discounting major changes in the field (e.g. new statistical procedures, research designs, or professional guidelines)
Diffusion of Responsibility	Discussing a problem with others in order to allow blame for a poor decision to be shared, so that individuals feel less personally responsible for the decision than if they had made the decision alone
False Consensus	The tendency of individuals to assume that others share their way of thinking about and acting in an ethical situation
Forcing a Decision	Making an arbitrary decision in order to have an answer and to escape the feeling of doubt and uncertainty
Framing	Inappropriately defining a situation as too narrow or too broad
Illusion of Control	Failing to recognize the dynamic nature of the situation because of an unrealistic assessment of their ability to control the situation
Inadequate Role Balancing	Unequal recognition of one’s roles and the corresponding responsibilities
Maintaining the Status Quo	Failing to act or acting in a specific way to maintain the modus operandi in order to avoid negative consequences
Misapplication of Principles	Failure to apply, misapplication, and/or lack of knowledge of principles
Moral Insensitivity	Awareness of how one’s actions affect others’ specifically, failure to recognize the ethical aspects of a situation and an inaccurate assessment of the importance of the ethical implications of the situation
Naivete	Failure to recognize the boundaries of one’s knowledge and expertise required in a given situation
Self-Handicapping	Creating and drawing attention to obstacles in order to protect themselves from potential failure
Self-Justification	When a person encounters cognitive dissonance, or a situation in which a person’s behavior is inconsistent with their beliefs, that person tends to justify the behavior and deny any negative feedback associated with the behavior
Undue Autonomy	Taking excessive responsibilities beyond one’s capabilities
Unquestioning Deference to Authority	Always accepting, without question, the opinions, guidance, and strategies utilized by professional authorities
Unwarranted Compromise	Compromising personal standards in order to avoid conflict
Willful Ignorance	Ignorance of outcomes of information that would cause one to move backwards, abandon, current plans, or to face negative consequences

Table 2

Complete List of Compensatory Strategies

Strategy	Operational Definition
Attending to Scientific Principles	Focusing on the broader principles of an academic discipline as opposed to specific elements of a situation
Complexity Evaluation	Examining the elements (contingencies, causes, restrictions, goals) of a situation and the dynamic relationship between the elements
Contingency Planning	Thinking about multiple alternatives in light of multiple consequences; developing back-up plans
Deliberative Action	Taking planned action when confronted with a problem
Following Appropriate Role Models	Taking direction pertaining to ethical issues from appropriate role models in one's scientific field (e.g., other scientists that are commonly held in high regard) or role modeling appropriate behavior to younger colleagues
Maintaining Objective Focus	Being aware of personal biases and the impact of personal goals and stereotypes
Monitoring Assumptions	Reducing the faulty or irrational assumptions one makes of others or of a situation by drawing upon relevant past experiences or examples rather than solely relying upon one's beliefs about others or the situation
Recognition of Insufficient Information	Understanding that more information is required to form an opinion or to make a decision
Recognizing Boundaries	Having an accurate assessment about one's expertise in relation to situation at hand, an awareness of formal role boundaries, or an understanding of the power structure of the organization
Selective Engagement	Considering personal costs or one's personal limitations as a means of deciding whether to become involved in a situation
Self-Accountability	Abiding by personal ethics, being honest with oneself, and being responsible for what one says and does
Strategy Selection	Reflecting on the dynamics of a situation, one's preference for a strategy, and one's belief that a strategy will be successful and efficient as a means of choosing an ethical decision-making strategy
Striving for Transparency	Emphasizing maintaining transparency in ethical decision making
Understanding Guidelines	Knowledge of the content and when to apply field and professional guidelines
Value/Norm Assessment	Awareness of the relevant value systems and using them when appropriate

Table 3

Means and standard deviations of all biases across fields

	Performance		Biological		Health		Humanities		Physical		Social	
	M	*SD*	*M*	*SD*	*M*	*SD*	*M*	*SD*	*M*	*SD*	*M*	*SD*
Abdication of Responsibility	1.375	0.317	1.583	0.516	1.763	0.503	1.550	0.274	1.393	0.378	1.547	0.430
Changing Norms and Standards	1.050	0.105	1.333	0.585	1.125	0.236	1.250	0.433	1.250	0.144	1.078	0.120
Diffusion of Responsibility	1.300	0.307	1.833	0.701	1.663	0.546	1.700	0.542	1.107	0.134	1.547	0.467
False Consensus	1.225	0.249	1.167	0.303	1.338	0.416	1.350	0.518	1.357	0.244	1.188	0.233
Forcing a Decision	1.200	0.197	1.083	0.129	1.225	0.242	1.800	0.512	1.179	0.278	1.391	0.329
Framing	1.675	0.313	1.292	0.246	1.663	0.327	1.750	0.306	1.821	0.494	1.656	0.287
Illusion of Control	1.175	0.237	1.250	0.224	1.263	0.286	1.550	0.716	1.286	0.267	1.406	0.364
Inadequate Role Balancing	1.250	0.289	1.125	0.209	1.188	0.197	1.300	0.209	1.214	0.304	1.203	0.228
Maintaining the Status Quo	1.325	0.392	1.083	0.129	1.288	0.284	1.500	0.586	1.143	0.197	1.234	0.281
Misapplication of Principles	1.375	0.270	1.583	0.492	1.800	0.320	1.700	0.209	2.286	0.509	1.500	0.258
Moral Insensitivity	1.575	0.290	1.667	0.516	1.713	0.424	1.800	0.481	1.929	0.718	1.563	0.310
Naivete	1.350	0.269	1.625	0.379	1.600	0.489	1.800	0.411	1.607	0.244	1.406	0.315
Self-Handicapping	1.500	0.264	1.250	0.316	1.413	0.347	1.600	0.548	1.107	0.134	1.547	0.390
Self-Justification	1.425	0.265	1.375	0.262	1.450	0.330	1.850	0.548	1.536	0.636	1.375	0.342
Undue Autonomy	1.225	0.184	1.125	0.306	1.238	0.309	1.250	0.177	1.286	0.304	1.203	0.277
Unquestioning Deference to Authority	1.100	0.129	1.167	0.204	1.300	0.599	1.750	0.935	1.143	0.197	1.281	0.328
Unwarranted Compromise	1.100	0.175	1.042	0.102	1.225	0.333	1.900	1.282	1.250	0.204	1.125	0.158
Willful Ignorance	1.300	0.284	1.417	0.465	1.250	0.281	1.350	0.379	1.214	0.225	1.172	0.218

Table 4

Means and standard deviations of all compensatory strategies across fields

	Performance		Biological		Health		Humanities		Physical		Social	
	M	*SD*	*M*	*SD*	*M*	*SD*	*M*	*SD*	*M*	*SD*	*M*	*SD*
Attending to Scientific Principles	1.400	0.175	1.875	0.345	1.575	0.282	2.100	0.418	1.536	0.567	1.719	0.407
Complexity Evaluation	1.850	0.337	1.833	0.438	1.825	0.381	1.750	0.354	1.714	0.393	1.609	0.438
Contingency Planning	1.475	0.432	1.500	0.316	1.563	0.451	1.650	0.487	1.500	0.354	1.438	0.403
Deliberative Action	1.675	0.409	1.500	0.158	1.588	0.391	2.100	0.840	1.821	0.572	1.703	0.421
Following Appropriate Role Models	1.800	0.815	1.500	0.316	1.438	0.472	1.200	0.209	1.286	0.366	1.781	0.664
Maintaining Objective Focus	1.375	0.412	1.833	0.438	1.550	0.470	1.750	0.306	1.500	0.250	1.563	0.382
Monitoring Assumptions	1.450	0.497	1.333	0.376	1.425	0.345	1.850	0.994	1.286	0.267	1.375	0.418
Recognition of Insufficient Information	1.750	0.408	2.583	0.606	2.025	0.595	2.150	0.859	2.143	0.923	2.047	0.600
Recognizing Boundaries	1.700	0.453	1.833	0.645	2.188	0.458	1.700	0.411	1.500	0.456	1.859	0.329
Selective Engagement	1.325	0.237	1.208	0.188	1.375	0.329	1.450	0.326	1.214	0.173	1.391	0.241
Self-Accountability	1.850	0.679	1.500	0.316	1.538	0.356	2.050	1.137	1.893	0.537	1.641	0.483
Strategy Selection	1.100	0.129	1.292	0.246	1.300	0.394	1.200	0.209	1.321	0.189	1.203	0.277
Striving for Transparency	1.950	0.497	1.375	0.306	1.513	0.376	1.400	0.285	1.714	0.336	1.875	0.532
Understanding Guidelines	1.825	0.736	1.917	0.683	2.313	0.567	2.100	1.220	2.000	0.408	2.234	0.478
Value/Norms Assessment	1.850	0.555	1.542	0.368	1.863	0.349	2.150	0.720	1.929	0.426	1.781	0.651

Table 5

Significant Variability Differences in Biases across Academic Fields

Variable - *Biases*	HoV	Variability Differences	Field Displaying More Variability	*p*
Changing Standards and Norms	$p = .004$	Performance & Biological Sciences,	Biological Sciences	.028
		Performance & Humanities,	Humanities	.027
		Biological Sciences & Social Sciences,	Biological Sciences	.009
		Humanities & Social Sciences	Humanities	.010
Moral Insensitivity	$p = .032$	Physical Sciences & Social Sciences,	Physical Sciences	.010
		Performance & Physical Sciences	Physical Sciences	.027
Naivete	$p = .028$	Health Sciences & Performance,	Health Sciences	.018
		Health Sciences & Physical Sciences,	Health Sciences	.022
		Health Sciences & Social Sciences	Health Sciences	.031
Self-Justification	$p = .036$	Humanities & Social Sciences,	Humanities	.038
		Humanities & Biological Sciences,	Humanities	.005
		Humanities & Health Sciences,	Humanities	.026
		Humanities & Performance	Humanities	.001
Unquestioning Deference to Authority	$p = .001$	Humanities & Biological Sciences.	Humanities	.001
		Humanities & Physical Sciences,	Humanities	.001
		Humanities & Social Sciences,	Humanities	.001
		Humanities & Performance,	Humanities	.001
		Social Sciences & Performance	Social Sciences	.025
Unwarranted Compromise	$p = .001$	Humanities & Performance,	Humanities	.001
		Humanities & Physical Sciences,	Humanities	.001
		Humanities & Social Sciences	Humanities	.001
		Humanities & Biological Sciences,	Humanities	.001
		Humanities & Health Sciences,	Humanities	.001
		Biological Sciences & Social Sciences	Social Sciences	.031
Willful Ignorance	$p = .022$	Biological Sciences & Physical Sciences,	Biological Sciences	.001
		Biological Sciences & Social Sciences,	Biological Sciences	.001
		Humanities & Social Sciences,	Humanities	.020
		Biological Sciences & Performance,	Biological Sciences	.018

Variable - ***Biases***	HoV	Variability Differences	Field Displaying More Variability	***p***
		Biological Sciences & Health Sciences	Biological Sciences	.014

Note. HoV = Overall homogeneity of variance

Table 6

Significant Variability Differences in Compensatory Strategies across Academic Fields

Variable Compensatory Strategies	HoV	Variability Differences	Field Displaying More Variability	*p*
Deliberative Action	$p = .035$	Humanities & Biological Sciences,	Humanities	.025
		Biological Sciences & Social Sciences,	Social Sciences	.003
		Humanities & Health Sciences,	Humanities	.041
		Performance & Biological Sciences,	Performance	.014
		Health Sciences & Biological Sciences	Health Sciences	.025
Following Appropriate Role Models	$p = .002$	Humanities & Social Sciences,	Social Sciences	.035
		Performance & Biological Sciences,	Performance	.006
		Performance & Health Sciences,	Performance	.006
		Performance & Humanities,	Performance	.003
		Performance & Physical Sciences	Performance	.007
Monitoring Assumptions	$p = .028$	Humanities & Physical Sciences,	Humanities	.044
		Humanities & Social Sciences,	Humanities	.038
		Humanities & Health Sciences	Humanities	.007
Selective Engagement	$p = .036$	Health Sciences & Physical Sciences,	Health Sciences	.012
		Health Sciences & Biological Sciences	Health Sciences	.032

Note. HoV = Overall homogeneity of variance