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Pressure and Ethical Decision-making

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Abstract

Performance pressure degrades performance on many types of tasks. Mounting evidence, however, suggests that pressure may not affect ethical decision-making. For the present study, participants analyzed an ethical dilemma using a cognitive tool (ACED IT), expressive writing, or a control task, and their decisions were compared for participants in high and low pressure conditions. Perceptions of moral intensity were also measured.

Contribution of Proposed Model: The current project found that the ACED IT map appears to be an effective cognitive tool for aiding ethical decision-making. The ACED IT group performed better on ethical decision-making (EDM) indices than did participants in the other groups. Pressure did not have an impact with regard to the cognitive processes involved in EDM. Pressure did, however, have a significant effect on perceptions of the problem. Implications of this pattern of results is discussed.

Scope of Work: It is important to determine whether pressure impacts EDM, so that training interventions can address pressure effectively. The present study suggests that, while pressure may not have an impact on ethical decision-making, pressure does seem to impact perceptions regarding ethical decision-making.

Keywords: ethical decision-making, cognitive tool, ACED IT, pressure, moral intensity

Pressure and Ethical Decision-making

Performance pressure has been demonstrated to be detrimental to performance on many different types of tasks, especially those that are cognitively demanding (Baumeister, 1984; Beilock & Carr, 2001; Lewis & Linder, 1997). Because of the ambiguity and emotional elements involved, ethical decision-making (EDM) is one such cognitively demanding task (Mumford et al., 2006). Ethical decision-making is likely to be negatively impacted by a great deal of pressure due to the effect of stress on the complex cognitive processes involved (Fiedler & Garcia, 1987). Indeed, in a qualitative analysis of scientific misconduct, Jasanoff (1993) determined that production pressure was a key variable associated with ethical misconduct. Similarly, professionals in the sciences perceive production pressure to be the most influential cause of ethical misconduct in scientific work (Goldberg & Greenberg, 1994). Additionally, Malhotra, Ku, and Murnigan (2008) suggest that poor ethical decision-making is likely when people in organizations are pressured to "win at all costs". Similar findings have been demonstrated with student samples as well; students' poor ethical decision-making increases with competitive pressure (Nill, Shibrowsky, & Peltier. 2004). Thus, it appears that pressure often inhibits performance on cognitively demanding tasks, such as ethical decision-making.

On the other hand, mounting evidence suggests that performance pressure may not impact complex cognitive processes, such as forecasting and EDM (Byrne, Shipman, & Mumford, 2010; Stenmark et al., 2010; 2011; 2013). These studies seem to suggest that these processes are not impacted by this situational variable, despite the fact that many other, similarly complex processes, are, indeed negatively impacted by pressure. Evidence suggesting that people perceive pressure as an antecedent to unethical behavior (De Vries, Anderson, & Martinson, 2006) may indicate that people use such pressure as an excuse for misbehaving.

Could there be something inherent in the lab setting that attenuates the impact of pressure on this cognitive task? Pressure can be difficult to manipulate in a laboratory setting, as lab tasks tend to be

relatively artificial and inconsequential. There are a number of explanations for why pressure may have failed to impact forecasting and ethical decision-making in empirical studies, and how these studies may differ from real-world problem-solving. In particular, pressure may be more likely to impact ethical decision-making in real-world environments when people are following the natural course of these problem-solving activities, as opposed to responding to specific, written prompts in the laboratory. Thus, simply by the nature of studying these processes, the impact of pressure may be lost in the laboratory. Perhaps an examination of how pressure changes an individual's *perception* of an ethical situation could shed some light on the dynamics of this relationship.

Therefore, the present study examined two different cognitive techniques for ethical decision-making, including ACED IT, a structured cognitive map and an expressive writing task, in which participants were allowed to freely write their thoughts about the problem, without specific prompts. Specifically, participants analyzed an ethical dilemma using one of two methods, and their forecasts and the ethicality of their decisions were compared. In addition to examining the different cognitive strategies, the study also examined whether the results of these strategies would be impacted by pressure. Finally, the present study examined participants' perception of the ethical situation, to determine if those perceptions might be impacted by pressure.

Cognitive Techniques

ACED-IT. This tool is a structured map (Kreitler et al., 2009; 2012; 2012; 2014) in which participants fill in the blanks eliciting specific types of information relevant to the problem at hand (see Figure 1). ACED IT stands for Assess, Create, Evaluate, Decide, Implement, and Test. Its development was based on theories of ethical decision stages (Toren & Wagner, 2010; Robbins & Judge, 2007) and multiple perspective taking (Atha-Weldon & Dansereau, 2006; Hall & Davis, 2007). The stages of ethical decision-making include defining the issue, generating options, evaluating the options, selecting the best

option, and acting on the decision (Robbins & Judge, 2007). Additional perspectives on the problem situation are incorporated by using an internal "Decision Team", by which students mentally consider the imagined advice of familiar people (such as Mother Theresa; Atha-Weldon & Dansereau, 2006), in order to generate potential solutions to the problem. The decision team has been shown to be efficacious in the development of multiple perspectives (Atha-Weldon & Dansereau, 2006), and theory (Robbins & Judge, 2007) indicates considering multiple perspectives is advantageous for decision-making.

Next, participants are asked to assess the solutions that they generated based on common ethical perspectives, including Virtue, Rights, Justice/Fairness, Common Good, and Utilitarian; these perspectives allow the decision-maker to have a broader view in the development and evaluation of the potential problem solutions (Velasquez et al., 1988). Then they select one of the solutions based on their evaluation. Finally, participants turn to the back of the form and describe the solution, including the steps needed to implement the solution, potential barriers to implementation, and solutions to the barriers. Then they forecast how the situation would work out following solution implementation.

Expressive writing. Expressive writing has been examined as a method for people to express their thoughts and feelings as a therapeutic technique (Pennebaker, 1997). Until recently, this technique has not been examined in terms of its usefulness in ethical decision-making. Indeed, Kreitler, Repasky, Travis, Dansereau, and Barth (2012) found that expressive writing might have a number of advantages over the structured ACED IT map with regard to decision-making. Additionally, this, less structured technique may exhibit different results with regard to performance pressure, which were not found in previous studies which used structured decision-making tasks (Stenmark, 2010; 2011). Perhaps those previous tasks were too structured to find performance decrements due to pressure, whereas this less structured task might lend itself to a more realistic cognitive process that could be impacted by

pressure. The study of expressive writing as a technique for aiding EDM is still in its infancy, thus, the following research question is proposed:

RQ1: How will decisions of participants using expressive writing compare to participants using ACED-IT?

Pressure

There are two mechanisms by which pressure is thought to influence performance (Beilock, Holt, Kulp, & Carr, 2004). The first is self-focus/explicit monitoring, in which performance pressure increases anxiety and self-consciousness about performing correctly, which disrupts the automated processes of high-level skills that normally run outside the scope of working memory during performance. The second is distraction, in which pressure fills working memory with thoughts about the situation and its importance, and these thoughts compete with the attention normally allocated to task execution. Studies of sensorimotor abilities seem to suggest that the former mechanism explains performance decrements due to pressure, but studies of cognitive problem-solving demonstrate that it might be due to the latter; indeed, distraction theories have been demonstrated to explain pressure decrements in cognitive tasks, especially unpracticed tasks. Performance on tasks with heavy cognitive demands declines, while low-demand tasks actually improve (Beilock, Holt, Kulp, & Carr, 2004).

Thus, it appears that the cognitive framework in use may determine whether pressure influences task performance. Perhaps the tasks used in previous EDM studies were so structured that they were not influenced by pressure in the same way a real-world decision-making situation would be. Thus, the present study used a less structured problem-solving technique: expressive writing, and the following hypothesis is proposed:

H2: The cognitive technique used will interact with pressure such that participants in the expressive writing condition will exhibit poorer decision-making performance when under high pressure than ACED-IT participants.

In addition to impacting behavior and performance, pressure may also influence an individual's perception of the problem situation. Indeed, in a qualitative analysis of scientific misconduct, Jasanoff (1993) found that perceptions of production pressure was associated with misconduct. Goldberg and Greenberg (1994) also determined that scientists perceived production pressure to be the number one cause of ethical misconduct in their lines of work. Additionally, Koh, Scully, & Woodliff (2011) found that students perceived greater cumulative pressure to be associated with a greater likelihood to commit plagiarism. Finally, in a study of environmental influence on ethical decision-making, Mumford et al. (2007) concluded that limited pressure was actually positively associated with ethical decision-making, while undue pressure is likely to promote unethical decisions. Thus, while there is research on how pressure is perceived, with regard to ethical situations, the actual influence of pressure on ethical decision-making and behavior is not clear. Perhaps examining the impact of pressure on an individual's perception of an ethical situation could shed some light on this issue. Thus, the following research question is proposed:

RQ1: How does pressure influence perceptions of an ethical situation?

Method

Participants

One hundred forty-eight undergraduate university students (93 females, 53 males, 2 chose not to answer; average age=20.7, SD=5.94) from a mid-sized public university in the southwest participated. Participants volunteered for this research as an optional means of fulfilling a course requirement or to receive extra credit for a class. The participants averaged just over 2 years in college (M = 2.12, SD =

1.15) and reported having worked an average of 5.28 years (SD = 9.62). Their work experience was largely retail, customer service, food service, and manual labor. The participants reported a variety of college majors, including Animal Science (3), Biology (10), Business (5), Computer Science (4), Criminal Justice (5), English (5), Exercise Science/Kinesiology (22), Nursing (29) Psychology (38).

Materials

ACED-IT. The ACED IT is a structured map (Kreitler et al., 2009; 2012; 2012; 2014) that uses a "fill-in-the-space" method to organize written information (see Figure 1). On the front of the map, participants describe the ethical dilemma, note practical issues, identify individuals affected by the dilemma, and organize a decision team. Next, participants employ the imagined advice of the decision team members and generate up to six potential solutions to the ethical dilemma. Participants then rate each solution on a Likert-type scale (0 = not at all, 3 = very much so), using ethical criteria (e.g., "It protects the rights of those involved"). Participants are encouraged to eliminate options that score poorly, and select from the ones that are rated most highly. Following the final selection of the preferred solution, the participant continues to the second side of the ACED IT map and details the steps necessary to implement the decision.

Expressive writing. Participants in the expressive writing condition were instructed to express their thoughts and feelings regarding the ethical dilemma. Participants received a sheet of paper, and they were instructed to write for at least 15 minutes about the problem in the vignette. These participants were given the following instructions, adapted from Pennebaker (1997) and Kreitler and colleagues (2012):

> Please use the space below to write your thoughts about the problem. You should write for at least 15 minutes.

Non-relevant comparison task. In order to provide the control group with a task of roughly equivalent complexity, participants in the control group completed a subset of items from a measure of planning skills developed by Mumford and colleagues (unpublished). The measure is described in Osburn and Mumford (2006) and Marta, Leritz, and Mumford (2005). The measure involves responding to a series of problem vignettes. The subset of items used in the present study includes two vignettes about businesses facing challenges. Following each scenario are five questions about the scenario, such as what caused the challenge and what restrictions are involved in the challenge. The questions are multiple choice, and participants select the response options that they identify as being the most relevant to the scenario. For example, one question following a scenario about challenges the restaurant Chili's is facing, reads, "What were the key factors in Chili's success during economic uncertainty?". Participants are then asked to choose up to 4 responses from the eight multiple choice options. This task was chosen because it is similar in cognitive complexity to solving an ethical problem, without actually containing elements of thinking about an ethical problem.

Procedure

Each participant was randomly assigned to one of three different groups: ACED IT (n=48), Expressive Writing (n=55), and a Control group (n= 45). The study was conducted in a lab setting with 6 participants at a time. They were instructed to sit at desk and follow the instructions on the computer. All participants read about a problem in a vignette. The vignette, which has been used in previous research on ethical decision-making (e.g., Stenmark et al., 2011; Stenmark, 2013), details a business dilemma intended to be representative of dilemmas experienced in the workplace.

Specifically, the participant is asked to play the role of a manager in a hypothetical technology firm that is developing a new mobile device. For the problem-solving task, participants received a

hypothetical email from one of the other characters in the organization, which details a problem with the data from testing the new mobile device, called the Platinum. It read:

> "As you might have heard, the safety test results on the Platinum look a little weird. It looks like the Platinum is associated with increased headaches, but we're not entirely sure what this means. It could be related to the phone, but it might be something else.
>
> Anyway, we need we need to get a report out to Mr. Robertson about the test results, and I'm not sure how to handle the safety data in the report. I am worried that if we put these results in the report, the release of the Platinum might get delayed for more testing, or worse, it might not get released at all. Plus, we're not even sure if the results are caused by the Platinum. We really need to get this product developed, so we can get it out on the market as soon as possible.
>
> Should I put the results from the safety test in the report?"

This problem vignette was selected from a larger set of problems that have been used in previous studies on ethical decision-making (Stenmark et al., 2011; Stenmark, 2013). A single vignette was chosen, so as to minimize participant fatigue. This vignette involves data management, which is one of four domains of research misconduct, as identified by Mumford et al., 2006. The other three domains include study conduct, business practices, and professional practices. Data management concerns the appropriate use and communication of data. Study conduct involves following relevant guidelines for conducting a research study, such as following IRB and confidentiality guidelines. Business practices concerns managing projects appropriately, such as avoiding conflicts of interest. Professional practices involves integrity within one's professional environment, such as maintaining objectivity when evaluating others' work for rewards, and representing professional accomplishments accurately. The present study focused on the data management dimension because it was believed that a problem from

this dimension would be the most relatable to university students. While the problem of data management and how to present unfavorable data, is not something students would probably relate to in a research context, this problem in a business context may be more relatable. In previous studies, this vignette exhibited the most engagement and the most variability in responses, and thus it appears to be complex and ambiguous enough not to have an "obvious" correct answer, such that participants would have to engage in more cognitive processes in order to solve the problem. This ambiguity also helps to minimize concerns about socially desirable responding.

Participants in the ACED IT condition were instructed to complete the map as if they were in the main character's position in the vignette. Participants in the expressive writing condition were instructed to write their thoughts about the problem for at least 15 minutes. Participants in the control condition completed an unrelated questionnaire after reading the problem in the vignette.

After completing their respective tasks, participants in all conditions answered questions about the problem in the vignette, indicating what their decision would be regarding the problem, detailing the steps, problems, and solutions to implementing the decision, and forecasting the likely outcomes of their decision implementation. The open-ended responses to these questions served as the dependent variables for comparing the different conditions.

Participants completed a number of post-task questionnaires following completion of the experimental task. First, participants completed a measure of perceived moral intensity, then they completed the Big Five Inventory personality questionnaire. Next they responded to a demographic questionnaire, and a manipulation check questionnaire. Finally, participants were given a debriefing form.

Pressure Manipulation

Consistent with pressure manipulations used by previous studies (Crouzevialle & Butera, 2013), participants in the high pressure condition were told that their performance would be recorded and evaluated using these instructions,

> "During the recorded part of the task, the experimenters will assess your performance. It is important for you to be proficient, to perform well and to obtain a high score, in order to demonstrate your competence. You should know that a lot of students will do this task. You are asked to keep in mind that you should try to distinguish yourself positively, that is, to perform better than the majority of students. In other words, what we ask you here is to show your competencies, your abilities. To sum up, your score will be judged by experimenters, and you will get access to it at the end of the experiment. Try to succeed the best you can, and to obtain a high final score. Because you will be given your rank compared to the other participants, try also to outperform others."

Participants in the low pressure condition were not given those instructions; they were not told that their performance will be observed or evaluated, and they were not told to compete with other students. Crouzevialle & Butera (2013) determined that instructions such as these, which emphasize the goal of performing better than other participants and that their performance would be recorded and evaluated, results in participants' experiencing performance pressure. Indeed, in the present study, a manipulation check revealed that participants in the high pressure condition perceived a higher degree of pressure than participants in the low pressure condition.

Measurement

Manipulation Check. In order to determine if the performance pressure manipulation did, indeed, result in participants' experiencing pressure, participants answered 2 questions regarding pressure. These questions were, "To what extent did you feel pressured to do well on the task?" and "To

what extent did you feel as if you were under a high amount of performance pressure?". These 2 questions were separated by other questions in the demographic questionnaire, so that they would be considered separately, and participants would not just automatically answer the same to both questions. Participants rated these questions on a scale from 1 to 5, with 1 being Not at all, and 5 being Very much so. Participants' ratings on these two questions were averaged in order to serve as their manipulation check score.

Moral Intensity. In order to measure the effect of pressure on participants' perceptions, perceived moral intensity was measured using 9-item Perceived Moral Intensity Scales (PMIS) adapted from Sweeney and Costello (2009) in order to measure the extent to which participants perceive the existence of elements of moral intensity in a separate stimulus scenario, involving a business dilemma. The scenario ended with an ethically questionable action taken by the main character of the scenario. After reading the scenario and the action taken, participants were asked to rate the extent of their agreement (e.g., Most people would agree that Tom's action is wrong).

The PMIS scale has nine dimensions, each represented by one questionnaire item. In addition to the 6 dimensions of moral intensity proposed by Jones (1991), there are three additional dimensions: ethical dilemma identification (item 1), ethical judgment (item 2), and ethical intentions (item 3), along with each of Jones' components of moral intensity (magnitude of consequences (item 4), social consensus (item 5), probability of effect (item 6), temporal immediacy (item 7), proximity (item 8), and concentration of effect (item 9). Identification of an ethical dilemma involves awareness that a dilemma may impact the welfare of individuals. Following identification comes an ethical judgment based on evaluating outcomes that may occur in a given dilemma. Next, an individual conceptualizes an intention to act based on an assessment of the choices (Sweeney & Costello, 1999). Magnitude of consequences is defined as the amount of harm (or benefits) done to the victims of the moral dilemma in question.

Social consensus is explained as the degree of agreement that an act is evil or good. Probability of effect is the combined function of the probability that the questionable act will be performed and cause any harm. Temporal immediacy is defined as the length of time between the present and onset of consequences of act in question. Proximity is defined as the feeling of empathy that the moral agent has for those involved. Finally, the concentration of effect is defined as the perceived focus of the intended effect on those (victims or beneficiaries) involved in the moral act (Jones, 1991).

Personality. Participants completed the Big Five Inventory (BFI; John, Donahue, & Kentle, 1991) in order to measure personality. The BFI measures five personality characteristics—Openness, Conscientiousness, Extraversion, Agreeableness, and Neuroticism—using short phrases that participants rated on a scale of 1 (strongly disagree) to 5 (strongly agree) to the extent that each statement applies to them. An example item is, “Does things efficiently”.

Content-Coding. The qualitative data obtained from the ACED IT maps were content-coded in order to examine the cognitive processes involved in contemplating an ethical decision. Six coders, all of whom were Masters students in industrial and organizational psychology, evaluated the written material. The raters completed a 10-hour frame-of-reference training program in which they were initially familiarized with the nature of the stimulus problem and the definitions of the dimensions to be rated, vis a vis benchmarks selected to reflect high, medium, and low levels of performance on the problem at hand. After the introduction to the problem and definitions, the coders evaluated a set of sample participant materials from all conditions, and ratings discrepancies were discussed. Once raters exhibited a satisfactory frame-of-reference regarding their practice ratings (i.e., acceptable interrater reliabilities on the small sample of practice rating materials), the coders rated the remainder of the participant materials on their own. The reliabilities cited below were based on the data that the coders provided on their independent ratings.

Dimensions of Interest. The coded dimensions were chosen and operationalized based on previous research that has determined them to be important for the cognitive processes involved in ethical decision-making (e.g., Mumford et al., 2006; Stenmark et al., 2010; 2011; 2013). For all participants, the coders performed numerical counts on: Number of Steps (in the Steps response field), and Number of Consequences identified (in the How did it work out? response field). Intra-class correlation coefficients for these dimensions ranged from .91 to .99. Coders next evaluated the quality of the plan, the quality of the forecast, and the ethicality of the final decision for all participants by evaluating material in the Decision response field (which includes the Steps, Possible Problems, and Solutions fields) and the How did it work out? response field. The plan was evaluated by appraising the detail, complexity, and criticality of the response material in the Steps, Problems, and Solutions response fields, each on a 5-point scale. For the rating scales, a rating of 1 was indicative of a low level of the construct, a rating of 3 was indicative of a moderate level of the construct, and a rating of 5 was indicative of a high level of the construct.

Detail was defined as the extent to which the response covered the elements of the problem (people, tasks, groups, etc.) in detail. Complexity was defined the extent to which the written material was composed of multiple, interrelated elements (people, groups, tasks, etc.). Criticality of the elements was defined as the extent to which the response considered the critical aspects of the problem scenario. Plan detail, complexity, and criticality were collected with the intention of aggregating them to form an overall score for plan quality, consistent with previous research on ethical decision-making (Stenmark et al., 2010; 2011; 2013). Indeed, the three dimensions were highly correlated with each other, with correlations ranging from .71 to .91, indicating that this aggregation would be appropriate. The interrater reliabilities calculated for plan detail, complexity, and criticality were .83, .82, and .81, respectively.

The forecast was evaluated by appraising the detail, complexity, and criticality of the response material in the How did it work out? response field, on a 5-point scale. Forecast detail, complexity, and criticality were collected with the intention of aggregating them to form an overall score for plan quality, consistent with previous research on ethical decision-making (Stenmark et al., 2010; 2011; 2013). Indeed, the three dimensions were highly correlated with each other, with correlations ranging from .85 to .94, indicating that this aggregation would be appropriate. The interrater reliabilities found for forecast detail, complexity, and criticality were .82, .88, and .83, respectively.

The coders evaluated the ethicality of the final decision on a 5-point scale, based on the material in the Decision response field. Markers of ethicality included 1) regard for the welfare of others, 2) attendance to personal responsibilities, and 3) adherence to/knowledge of social obligations. Regard for the welfare of others was defined as the extent to which a participant's response reflected attention and care for the welfare of others, including decisions that intentionally work to benefit others, and behaving for the benefit of others, even at personal expense. Attendance to personal responsibilities was defined as the extent to which a participant's response reflected actively avoiding bias and being accountable for one's actions and behaviors. Adherence to/knowledge of social obligations was defined as the extent to which a participant's response reflected an understanding and respect of cultural norms and values, including understanding guidelines and the duties of given social roles. The overall ethicality dimension took these subdimensions into account to provide the ethicality dimension in this study. The interrater reliability coefficient obtained for evaluations of ethicality was .91.

Results

Manipulation Check

Responses to the manipulation check questions were compared for participants in the high and low pressure conditions. Results indicated that participants in the high pressure condition (M = 5.87, SD

= 2.23) perceived significantly more pressure (t = 2.62, p = .01) than participants in the low pressure condition (M = 4.89, SD = 2.30). This indicates that the manipulation did, indeed, have the intended result, increasing high-pressure participants' perceptions of pressure.

Covariates

The present study collected data on gender and personality traits (the Big Five) to serve as potential covariates. None of these variables, however, were significantly related to the dependent variables; they were not significant covariates, and they were thus not retained as covariates in subsequent analyses.

PMIS Dimensions

In order to address the Research Question, a 3 (ACED IT vs. Expressive Writing vs. Control) x 2 (Pressure vs. No Pressure) MANOVA was conducted on the dimensions of the PMIS instrument: magnitude of consequences, social consequences, probability of effect, temporal immediacy, proximity, and concentration of effects (see Tables 1 and 2). Neither the main effect for the cognitive technique condition, $F(12, 274) = 1.15$, $p > .05$, nor the interaction, $F(12, 274) = 1.56$, $p > .05$ were significant. The main effect for pressure, however, was significant, $F(6, 137) = 3.16$, $p < .01$. Significant univariate main effects were obtained for temporal immediacy, $F(1, 142) = 4.00$, $p < .05$, and proximity, $F(1, 142) = 6.33$, $p < .05$, such that participants in the high pressure condition exhibited higher temporal immediacy and proximity scores (M = 3.54, SD = .16, and M = 4.29, SD = .20, respectively) than participants in the low pressure condition (M = 3.07, SD = .17, and M = 3.6, SD = .20, respectively).

Content-Coded Dimensions

A 3 (ACED IT vs. Expressive Writing vs. No Treatment) x 2 (Pressure vs. No Pressure) MANOVA was conducted on the content-coded dimensions: Number of Steps, Number of Problems, Number of

Solutions, Number of Consequences, Forecast Quality, Plan Quality, and Ethicality (see Tables 3 and 4). Neither the main effect for pressure, F (7, 136) = 1.51, $p > .05$, nor the interaction effect for pressure and condition, F (14, 272) = .93, $p > .05$ were significant. The main effect for the cognitive technique condition, however, was significant, F (14, 272) = 3.82, $p < .01$. Significant univariate main effects were obtained for Number of Steps identified, F (2, 142) = 6.01, $p < .01$, Number of Problems identified, F (2, 142) = 8.11, $p < .01$, Number of Solutions identified, F (2, 142), = 4.28, $p < .05$, and Number of Consequences identified, F (2, 142) = 3.83, $p < .05$.

LSD post hoc tests revealed that participants in the ACED IT group identified significantly more steps (M = 2.69, SD = .15) than did participants in the Expressive Writing, and Control groups (M = 2.26, SD = .14, and M = 1.93, SD = .16, respectively). Furthermore, participants in the ACED IT group identified significantly more problems (M = 2.39, SD = .12) than did participants in the Expressive Writing, and Control groups (M = 1.77, SD = .11, and M = 1.83, SD = .13, respectively). Participants in the ACED IT group identified significantly more solutions (M = 2.16, SD = .13) than did participants in the Expressive Writing, and Control groups (M = 1.75, SD = .12, and M = 1.66, SD = .13, respectively). Finally, participants in the ACED IT (M = 2.83, SD = .14) and Expressive Writing (M = 2.70, SD = .14) groups identified significantly more consequences than participants in the Control group (M = 2.28, SD = .15).

Correlation Analysis

Table 3 shows the correlations among the dependent variables. With regard to the rated variables, Ethicality was significantly positively related to the Number of Steps identified (r = .23, p < .01), Number of Problems identified (r = .26, p < .01), Number of Solutions identified (r = .21, p < .01), Number of Consequences identified (r = .29, p < .01), Forecast Quality (r = .54, p < .01), and Plan Quality (r = .42, p < .01). Forecast Quality was significantly positively related to the Number of Steps identified (r = .54, p < .01), Number of Problems identified (r = .55, p < .01), Number of Solutions identified (r = .57, p

< .01), Number of Consequences identified (r = .54, p < .01), and Plan Quality (r = .70, p < .01). Plan Quality was significantly positively related to the Number of Steps identified (r = .28, p < .01), Number of Problems identified (r = .36, p < .01), Number of Solutions identified (r = .41, p < .05), and Number of Consequences identified (r = .86, p < .01).

Discussion

Before turning to the broader contributions of the present study, a few limitations should be noted. First, this study employed a low-fidelity simulation of a complex, real-world problem requiring ethical decision-making. Past studies (e.g., Dailey & Mumford, 2005; Marcy & Mumford, 2007) have demonstrated that these types of tasks are interesting and engaging to student participants, however, extending the results to people solving ethical problems in real-world settings is an important step in determining the generalizability of these findings. Similarly, college students served as the participants for this study. While it is likely that the cognitive processes underlying ethical decision-making operate similarly for young adults, as with older adults, future studies should examine these processes in older, working populations, using real problems encountered by those individuals in their work.

Finally, some of the dependent variables in this study were measured using trained judges' content-coding of the participants' qualitative responses. Thus, it is possible that some of the relationships among these variables may be due, at least in part, to common method variance. We made an effort to assuage this concern by distinctly defining the different constructs to be rated and by rating each construct on different areas of the ACED IT map. Additionally, the rater training involved a great deal of effort making sure that they recognized the differences among the constructs and the operationalizations of the constructs in the qualitative material.

Despite these limitations, we believe that the results of the present study have significant implications for understanding the dynamics of pressure and EDM and the use and development of

cognitive tools designed to improve EDM. Based on the results of this study, we can draw the following conclusions: (a) performance pressure impacts perceptions of moral intensity, (b) performance pressure does not appear to influence EDM on a cognitive level, (c) completion of the ACED IT map resulted in improvements in a number of indicators of ethical decision-making, over expressive writing and the control group, (d) there are a number of cognitive strategies that are related to improved plans and forecasts in ethical decision-making, and (e) plan quality and forecast quality are significantly related to decision ethicality.

With regard to the effects of performance pressure on perceptions of moral intensity, participants in the high pressure condition perceived greater temporal immediacy and proximity, due to the perceived moral implications of the ethical dilemma, than participants in the low pressure condition. There were no significant effects of performance pressure on magnitude of consequences, social consequences, and probability of effect. This pattern of results makes sense; individuals experiencing performance pressure are likely to experience a sense of urgency, which could make them feel like negative consequences might be imminent, both temporally and in terms of distance from themselves. The findings with regard to the other dimensions is, perhaps, even more telling. Performance pressure did not result in participants' feeling like the consequences were any more severe, socially relevant, or probable to occur. This result could help to explain why there were null effects of pressure on the content-coded dimensions.

With regard to the cognitive processes involved in ethical decision-making, performance pressure had neither a main effect nor an interactive effect with problem-solving technique on the plan quality, forecast quality, or EDM. While this finding is in opposition to studies on pressure regarding problem-solving that suggest that pressure would result in distraction, impeding the cognitive processes (Beilock, Holt, Kulp, & Carr, 2004), this finding is consistent with other studies which have demonstrated

the failure of performance pressure to have an effect on complex cognitive processes (Byrne, Shipman, & Mumford, 2010; Stenmark et al., 2010; 2011). Perhaps the dimensions with null results exhibited on the PMIS could provide a clue as to the mechanism for how performance pressure affects (or does not affect, as the case may be) these cognitive processes. Participants in the high pressure condition did not perceive greater magnitude of consequences, greater social consequences, nor greater probability of effect. These would all be variables that would be expected to be related to cognition involving an ethical problem; if the problem has more severe consequences, more social consequences, or negative effects that are more probable, then one would expect cognition to change in some way. The null finding with regard to cognition makes a little more sense, in light of the indication that performance pressure does not result in changes in the way participants view those variables.

There may be other explanations for the null effects. It is possible that the manipulations used for these studies were not prominent enough to exert an effect on the study participants. This seems unlikely, however, given the manipulation checks that demonstrated that participants in the high pressure condition perceived significantly higher amounts of pressure. Additionally, pressure has been manipulated in a number of different ways in this and past studies, and this null finding persists. Stenmark, et al. (2010) manipulated pressure vis a vis the hypothetical organizational stimulus scenario; Stenmark (2013) manipulated pressure by varying the amount of a reward, based on the quality of performance. In the present study, performance pressure was manipulated by telling participants their performance would be observed and evaluated. Despite the counter-intuitive nature of the null finding, it is becoming increasingly apparent that performance pressure may, in fact, not impair these complex cognitive processes. Still, future studies should examine performance pressure in other settings, using other manipulations, in order to determine if pressure does not, indeed, impact the planning, forecasting and EDM processes. Manipulating performance pressure in a real-world setting, using more consequential outcomes might result in different findings.

Overall, while there were no group differences, in the more macro-level cognitive processes measured by the quality of the plans, forecasts, or overall ethicality of the decisions, completing the ACED IT form does appear to elicit specific strategies that are known to be related to better ethical decision-making (e.g., Mumford et al., 2009, Stenmark et al., 2010, 2011, 2013): identifying steps to solving the problem, barriers to implementing the solution, and solutions to those barriers. This finding is consistent with previous studies of the ACED IT (Stenmark & Kreitler, 2017). This finding is an encouraging indicator that perhaps in a real-world setting, completing the ACED IT form would result in better overall decisions. Future studies, however, should examine the use of cognitive tools in more realistic settings with real decisions.

The correlation analysis demonstrated that the quality of the plans and the quality of the forecasts written by participants was positively related to the number of steps, problems, solutions, and consequences identified, as well as to ethicality. These findings highlight the importance of considering multiple, interrelated elements of the problem situation in order to generate superlative plans and forecasts (Marta, Lertiz, & Mumford, 2005; Stenmark et al., 2010, 2011, 2013). Thus, in order to culminate a problem-solving process with high-quality plans and forecasts, individuals should engage in a cognitive strategy that emphasizes a focus on these important situational variables.

Conclusion and Future Scope of Work

The findings of this study have both theoretical and practical implications. Theoretically, this study demonstrated that while performance pressure may not have an impact at the behavioral level, it does appear to impact perceptions. This could be an explanation for why pressure appears to impact some situations relevant to EDM, and not others. Future studies should further explore the role of performance pressure on perceptions and attitudes, in order to determine whether those variables may serve as mediators between pressure and ultimate performance. Additionally, this study found that

while the ACED IT map was developed as a general decision-making device, it is also a useful tool for ethical decision-making. Finally, this study has provided further evidence that planning and forecasting are two cognitive processes that are vital for ethical decision-making, and that several specific strategies, including identifying steps for implementing the problem, barriers, and solutions to the barriers, are essential elements of planning and forecasting. Identifying these processes involved helps researchers to understand the nature of ethical decision-making in order to improve our theories, interventions, and measurement of ethical decision-making.

This study also has practical implications, primarily in terms of training and interventions. The ACED IT form has been shown to be an effective instrument for ethical decision-making, and organizations would do well to allow employees access to the ACED IT and other similar tools, in order to aid their decision-making. Additionally, the findings of this study imply that training programs and other ethical decision-making interventions should focus on helping people to improve their planning and forecasting activities, in order to make the best, most informed, ethical decision.

In summary, the results of this study demonstrated that performance pressure impacts some perceptions of the ethical situation, and not others, and that this pattern of effects might be the key to understanding how and when pressure impact ethical decision-making and behavior. Furthermore, this study found that the ACED IT tool influences the cognitive processes that individuals utilize as they work to resolve ethical dilemmas. Completing the ACED IT tool resulted in significantly better performance when compared to expressive writing and control tasks on a number of dimensions held to be important for ethical decision-making (Mumford et al., 2008). Finally, this study provided evidence that, perhaps, pressure may not, in fact, inhibit the cognitive processes involved in ethical decision-making, which is somewhat counterintuitive, but nonetheless, relevant, for understanding the context in which ethical decisions are made.

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Table 1

3 (Cognitive Technique) x 2 (Pressure) Multiple Analysis of Variance for PMIS Dimensions

Effect	*df*	*F*	*P*	*Partial η2*
Cognitive Technique	12	1.15	.32	.05
Pressure	6	3.16**	.01	.12
Cognitive Technique x Pressure	12	1.56	.10	.06

*Note: ** p < .01*

Table 2

3 (Cognitive Technique) x 2 (Pressure) Multiple Analysis of Variance for PMIS Dimensions Univariate Results

Source	*df*	*F*	*p*	*Partial η2*
Technique:				
Magnitude of Consequences	2	.19	.83	.00
Social Consensus	2	2.28	.11	.03
Probability of Effect	2	.16	.85	.00
Temporal Immediacy	2	.62	.53	.01
Proximity	2	3.33*	.04	.05
Concentration of Effect	2	1.01	.37	.01
Wilks' Lambda	12	1.15	.32	.05
Pressure:				
Magnitude of Consequences	1	.00	.98	.00
Social Consensus	1	1.33	.25	.01
Probability of Effect	1	1.76	.19	.01
Temporal Immediacy	1	4.00*	.05	.03
Proximity	1	6.33*	.01	.04
Concentration of Effect	1	1.51	.22	.01
Wilks' Lambda	6	3.16**	.01	.12

*Note: * p < .05; ** p < .01*

Table 3

3 (Cognitive Technique) x 2 (Pressure) Multiple Analysis of Variance for Content-Coded Dimensions

Effect	*df*	*F*	*P*	*Partial η2*
Cognitive Technique	14	3.82**	.00	.16
Pressure	7	1.51	.34	.06
Cognitive Technique x Pressure	14	.93	.53	.05

*Note: ** p < .01*

Table 4

3 (Cognitive Technique) x 2 (Pressure) Multiple Analysis of Variance for Content-Coded Dimensions Univariate Results

Source	*df*	*F*	*p*	*Partial η2*
Technique:				
Number of Steps Identified	2	6.01**	.00	.08
Number of Problems Identified	2	8.11**	.00	.10
Number of Solutions Identified	2	4.28*	.02	.06
Number of Consequences Identified	2	3.83*	.02	.05
Ethicality	2	.88	.42	.01
Forecast Quality	2	.38	.68	.01
Plan Quality	2	.17	.84	.00
Wilks' Lambda	14	3.82**	.00	.16
Pressure:				
Number of Steps Identified	1	.06	.80	.00
Number of Problems Identified	1	2.93	.09	.02
Number of Solutions Identified	1	.69	.41	.01
Number of Consequences Identified	1	1.38	.24	.01
Ethicality	1	.28	.60	.00
Forecast Quality	1	3.33	.07	.02
Plan Quality	1	3.19	.08	.02
Wilks' Lambda	7	1.15	.34	.06

*Note: * p < .05; ** p < .01*

Table 5

Correlations among Dependent Variables

	1.	2.	3.	4.	5.	6.	7.	8.	9.	10.	11.	12.	13.
1. MC		-.10	.42**	.34**	.04	.55**	-.17*	-.03	-.17*	-.17*	-.11	-.18*	-.14
2. SC			.09	.07	.16	-.14	-.01	.04	.05	-.01	-.06	-.04	-.05
3. PE				.36**	.06	.44**	-.08	-.05	-.22**	-.22**	-.15	-.21*	-.17*
4. TI					.15	.32**	-.19*	-.06	.00	-.08	-.01	-.06	.01
5. Prox						-.03	-.08	-.02	.01	-.05	-.03	-.09	-.03
6. CE							-.14	-.12	-.19*	-.24**	.03	-.19*	-.04
7. Ethicality								.28**	.26**	.21*	.29**	.54**	.42**
8. NumSteps									.50**	.54**	.33**	.54**	.28**
9. NumProb										.71**	.36**	.55**	.36**
10. NumSols											.39**	.57**	.41**
11. NumCons												.54**	.86**
12. FoQual													.70**
13. PlanQual													

*Note: * p < .05; ** p < .01; MC* = magnitude of consequences, SC = social consensus, PE = probability of effect, TI = temporal immediacy, Prox = proximity, and CE = concentration of effect

Figure 1. ACED IT map