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A CREATIVE TIME: GOAL SETTING, PRIORITIZING, AND TIME CONSTRAINTS ON INFORMATION GATHERING

A DISSERTATION APPROVED FOR THE
DEPARTMENT OF PSYCHOLOGY

BY THE COMMITTEE CONSISTING OF

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Abstract

The creative process model developed by Mumford et al. (1991) is a valuable framework for understanding the fundamental processing operations required for creative problem-solving. Of the eight processes outlined in the model, the information gathering stage has historically received less attention (Mumford, Baughman, Supinski et al., 1996), limiting our understanding of ways to improve information gathering and resulting creative solutions. Extending on prior research, the present effort examines how goal setting (performance vs. learning), prioritizing (key facts vs. anomalies), and time constraints (present vs. absent) can influence information gathering and subsequent creative performance. Findings suggest that while imposing a time constraint can detract from the quality of information gathered, setting a performance goal coupled with the absence of a time constraint can lead to higher quality of information gathered. Results also reveal a moderated mediation effect of goal setting and time on creative performance through the quality of information gathered. Theoretical and practical implications, limitations, and future directions are discussed.

Keywords: creativity, creative problem-solving, information gathering, goal setting, prioritizing, time constraints

Introduction

In today's rapidly evolving landscape of work, it is imperative for organizations to generate creative solutions in response to the ever-changing consumer needs to maintain a competitive advantage. Creativity and innovation lie at the heart of continuous growth and enable organizations to create new trends to address market needs and shape the industry for years to come. The importance of producing creative solutions can be seen in many Fortune 500 company success stories. Consider Tesla, Inc., for example. The company ideated, tested, and introduced an advanced technology to make vehicles more energy efficient and address changing consumer preferences towards more sustainable alternatives, all the while constructively disrupting the industry. This led to competitors re-strategizing how they develop their own product roadmaps to align with changing market trends and remain competitive in the marketplace.

Apparent from the preceding example, creativity is a precursor for innovation and organizational development, success, and survival in a variety of settings (Sternberg, 1999; Heunks, 1998). For example, creativity and innovation have been shown to be integral to the success and long-term survival of non-profit organizations (Coule & Patmore, 2013), universities (Bennich-Björkman, 2017), and governmental as well as social service organizations (Connelly & Zaccaro, 2017). These findings beg an important question. What gives rise to the generation of creative problem solutions? One approach has been to examine key processes involved in creative problem-solving (Mumford et al., 1991) including problem definition, information gathering, conceptual selection, conceptual combination, idea generation, idea evaluation, implementation planning, and solution monitoring. Of the eight critical processes, information gathering is one such process that warrants further investigation. Although prior research

indicates information encoding and the use of search strategies can impact creative performance broadly (Perkins, 1992), much remains to be understood with respect to factors that can facilitate or detract from effective information gathering.

Given the goal-oriented nature of creative problem-solving and need for attending to practical constraints (Merrifield et al., 1962; Mumford et al., 1991), research on planning and common organizational constraints on performance (e.g., resources) has utility for advancing our understanding of the information gathering process. Planning is complex and involves various processes and operations (e.g., forecasting, formulating mental models; Shipman et al., 2010; Mumford, Hester, et al., 2012). Goal setting and prioritizing are two such processes that may impact the way an individual searches for and encodes information. An ample amount of evidence lends support to the positive effects of setting specific, difficult goals on performance (Locke & Latham, 1990, 2002, 2013; Latham & Locke, 2007), yet the impact of setting specific learning and performance-oriented goals on information gathering and subsequent creative performance has not been studied to our knowledge. Similarly, little research has been conducted on contextual or situational conditions that facilitate or hinder the successful execution of creative processes (Mumford, Medeiros, et al., 2012). Prioritizing may guide the information gathering process. When inundated with a vast amount of information, it can become challenging to identify relevant and inconsistent pieces of information that are critical to consider. Prompting individuals to prioritize information bearing on key facts and focus on anomalies may help guide their information gathering and result in better creative performance (Mumford, Baughman, Supinski, et al., 1996). Finally, given that time is a limited resource in organizations, it is valuable to consider the effect of a moderate time constraint on information gathering and creative performance. Findings have been mixed regarding the impact of imposing a time

constraint on creative solutions and its effects on information gathering have not yet been examined (Weenig & Maarleveld, 2002; Medeiros et al., 2014). The present effort extends previous research by examining the joint influence of goal setting, prioritizing, and a moderate time constraint on information gathering and overall creative performance.

Accordingly, the purpose of the present effort is to investigate the direct and joint influence of goal setting, prioritizing, and time constraints on information gathering and subsequent creative performance.

The Creative Process Model

Creativity can be defined as involving the production of high-quality, original, and elegant solutions (Besemer & O'Quin, 1999; Christiaans, 2002) in response to complex, novel, ill-defined, or poorly structured problems (Mumford & Gustafson, 1988, 2007). As such, the essence of creativity lies in solving a particular type of problem, and creative performance is subsequently evaluated in terms of the products made in solving the problem. Although there are many factors that can influence creative performance, the cognitive processes involved in creative thought can be examined to understand how individuals arrive at high-quality, original, and elegant solutions (Mumford & McIntosh, 2017). More specifically, the widely accepted creative process model proposed by Mumford et al. (1991) provides a useful framework for understanding the fundamental processing operations required for creative problem-solving. This model was formulated on the basis of three assumptions. First, creative problem-solving is rooted in knowledge and information. Knowledge is a key aspect, as it provides a ground for processing information (Baer, 2003; Rich & Weisberg, 2004). Second, individuals cannot form new ideas simply by using extant knowledge; the knowledge has to be recombined and reorganized to assemble new knowledge, facilitating the creation of novel ideas (Finke et al.,

1992; Mumford et al., 1989). Third, these ideas should be assessed and developed into feasible plans to guide work on a creative task (Mumford et al., 2001).

The creative process model identifies eight processes. Addressing complex, ill-defined problems requires an individual to impose structure and seek clarity to make sense of the situation, which can be done by considering procedures, constraints, and other information that should be attended to during subsequent stages of the creative problem-solving process (Csikszentmihalyi, 1988; Mumford, Baughman, Threlfall, et al., 1996). Thus, problem definition sets the tone for the execution of other processes, such as information gathering and category combination (Mobley et al., 1992; Sternberg, 1986a, 1986b). Individuals then engage in information gathering, which entails searching and encoding key information pertaining to the problem (Mumford, Baughman, Supinski, et al., 1996). Conceptual selection and conceptual combination consist of individuals selecting concepts or cases that can be used to understand the problem and subsequently combining and reorganizing existing knowledge structures and conceptual categories. Executing these processes can lead to new ways of understanding the ill-defined problem and thereby serve as a springboard for generating new ideas (Mobley et al., 1992; Baughman & Mumford, 1995; Mumford, Supinski, et al., 1996; Mumford & McIntosh, 2017). After ideas are generated, they must be evaluated. A key aspect of idea evaluation is forecasting the outcomes of idea implementation. This involves conducting an appraisal of the viability of the idea in relation to applicable standards and implementation requirements, which can lead to pursuing the idea as it stands, revising it, or abandoning the idea completely (Mumford et al., 2002). Lastly, implementation planning and solution monitoring involve individuals executing their plan and actively monitoring outcomes. Extensive research conducted by Mumford and colleagues lends support to these eight interdependent creative processes

(Baughman & Mumford, 1995; Friedrich & Mumford, 2009; Lonergan et al., 2004; Mumford, Baughman, Threlfall, et al., 1996; Mumford et al., 1997; Reiter-Palmon et al., 1997; Scott et al., 2005). Moreover, successful execution of these processes has been found to be strongly, positively related to the generation of creative problem solutions (Mumford & McIntosh, 2017). It is important to underscore the dynamic nature of this model, such that individuals can revisit earlier steps if they are not successful in executing a particular process (Mumford, Medeiros, et al., 2012).

Information Gathering and Creative Performance

Information gathering involves actively searching for and encoding information in the environment. The way people search for information can vary depending on the individual. In fact, research has indicated that people differ in terms of the search strategies they use to gather information from their environment. These strategies influence the type and quality of the information gathered, which can in turn, impact overall creative performance (Mumford, Baughman, Supinski, et al., 1996; Mumford, Medeiros, et al., 2012). A study conducted by Mumford, Baughman, Supinski, et al. (1996) investigated how differences in the types of information people attend to and gather influence creative problem-solving on encoding and advertising-related tasks. Participants that focused on key relevant information and discounted distracting, irrelevant information generated higher quality and more original solutions on the creative problem-solving tasks. In contrast, focusing on broad and distal principles and reviewing information about goals and restrictions had a negative influence on solution quality and originality. Overall, findings from this study demonstrate that different strategies used to gather information do in fact have differential effects on creative performance and provide a

springboard for studying the effects of additional strategies such as goal setting and prioritizing on information gathering.

Information Gathering and Goal Setting

The ill-defined nature of some problems requires individuals to systematically gather and encode relevant information to facilitate the execution of subsequent problem-solving processes. Information gathering is complex, where successful execution depends on one's ability to attend to critical facts and anomalies. Performance cues may serve to guide information search in a manner that effectively facilitate creative efforts (Perkins, 1995). Isaak and Just (1995) suggest goals and restrictions give direction to information search and attending to these types of cues may exert effects on creative performance. As such, setting goals relevant to the creative problem prior to gathering information may serve as an important cue that guides the process. A goal refers to pursuing and achieving a particular standard of proficiency on a given task, typically under a time constraint (Locke & Latham, 1990). According to goal-setting theory, one of the most extensively developed theories in psychology, setting goals can provide purpose to individuals for what might otherwise be deemed a mundane task. Setting specific and difficult goals as opposed to easy, vague, or "do your best" goals have been shown to contribute to better performance. There is a wide array of research demonstrating how goals influence individuals' choices. In addition to giving direction to one's pursuit, setting and committing to a goal enhances effort, persistence, and guides people to search for strategies to achieve it (Locke & Latham, 1990, 2009).

The goal setting literature makes an important distinction between performance and learning goals (Locke & Latham, 1990, 2013). A specific, high-performance goal should be set when ability is not viewed to be a problem (Mumford & Frese, 2015). When individuals have the

ability to attain the goal, exerting effort and persisting in the wake of challenges until the goal is achieved happens automatically. However, effort and persistence alone are not sufficient when individuals do not possess the requisite knowledge and skill to attain a goal (Locke & Latham, 1990). In instances when ability is lacking, a learning goal can be more beneficial for goal achievement because it enables the individual to develop a plan for attaining the goal instead of focusing on the specific outcome. Kanfer and Ackerman (1989) examined the impact of different types of goals in an air traffic control simulation (i.e., highly complex task). Results showed that when individuals lack the knowledge to effectively complete a task, a specific, high performance goal decreases performance compared to goals recommending that individuals do their best. Performance tends to suffer in such instances because cognitive resources are directed towards learning the process to perform well (Mumford & Frese, 2015). A study conducted by Winters and Latham (1996) lends further support to this idea. The researchers found that in the absence of requisite knowledge, encouraging individuals to do their best instead of setting a specific, difficult performance goal led to better performance. However, performance was even higher when participants set learning goals instead of simply being told to do their best because it resulted in individuals carefully planning how to achieve the task. Finally, using a complex business simulation, Seijts and Latham (2005) investigated the effects of learning versus performance goals. They found that individuals assigned to the learning goal condition performed the best. These individuals dedicated time to examine and analyze available information that was relevant to the task, which facilitated goal attainment and performance.

Findings from Mumford, Baughman, Supinski et al.'s (1996) study suggested reviewing information about goals on a creative task was negatively related to solution quality and originality. It should be noted that in this study, goals that needed to be addressed in solving the

problem were not framed in terms of learning or performance-oriented goals. Given the complex and ill-defined nature of a creative problem, it stands to reason that setting a specific learning or performance goal may give direction to information gathering and improve subsequent creative performance on a task. Learning goals divert attention away from the final outcome and provide an opportunity for individuals to focus on strategies to increase performance (Seijts & Latham, 2005). In contrast, performance goals enable individuals to remain focused on the end product. Thus, both types of goals may assist individuals in effectively gathering information and promote better performance on the creative task.

Goals can also be viewed as a common organizational constraint on performance, which can subsequently hinder or contribute to performance. Historically, it has been believed that constraints inhibit creative thought because constraints make a problem less complex and more defined, thereby detracting from the production of original solutions. However, constraints may lead to augmenting search and processing activities in an effort to generate a solution or help restructure the ill-defined problem, which can enhance creative performance (Stokes, 2007; Medeiros et al., 2014; Medeiros et al., 2018). A substantial body of evidence exists lending support to the latter perspectives (e.g., Finke et al., 1992; Mumford, 2002). Medeiros et al. (2014) investigated the effects of imposing or not imposing constraints prior to tasking participants with developing advertising campaigns for a new product. Constraints took the form of fundamentals in marketing, themes in marketing, environmental information, and task objectives. Results showed that task objective constraints led to better creative performance when individuals were motivated, but imposing multiple constraints negatively impacted creative problem-solving. In a more recent study examining the role of constraints on various creative processes (e.g., problem identification, conceptual combination), Medeiros et al. (2018) found

that constraints introduced early on in creative problem-solving tend to have a positive impact on creative performance. However, it is important to note that this study did not include a measurement of information gathering. These findings underscore the importance of considering the timing, nature, and number of constraints imposed on creative performance.

Imposition of constraints need to be considered in tandem with people's willingness to work with constraints during creative problem-solving (Nohria & Gulati, 1996). The effect of a particular constraint on creative performance may largely depend on whether an individual is willing to dedicate resources to actively work with or around the constraint. According to De Dreu & Nijstad (2008), the relevance of the goal pertaining to the creative problem can impact people's willingness to actively engage with a constraint. Additionally, intrinsic interests are believed to exert effects on an individual's willingness to identify and work with constraints in creative contexts (Amabile, 1996; Zhou, 2003). In the present effort, providing individuals with a specific learning or performance goal that facilitates the information gathering process rather than a vague or "do your best" goal may help increase the identification with and relevance of the creative problem, resulting in a greater willingness to leverage the goal constraint to guide information gathering and enhance creative performance. Prior research also suggests that when individuals view constraints as manipulable and are willing to work with them, constraints do not necessarily inhibit creative performance (Stokes & Fisher, 2005; Weisberg, 2011; Medeiros et al., 2014). For example, because the nature of a learning goal shifts attention away from the desirable end outcome and towards focusing on learning strategies to increase performance, it can create the illusion of having control over the constraint, making the goal appear malleable in nature rather than fixed.

By the same token, the potential negative implications of goal setting on information gathering and creative problem-solving should be considered. A key finding from Mumford, Baughman, Supinski et al.'s (1996) study suggests that rather than using goals to structure the information gathering process, it may be more advantageous for individuals to perform a more extensive and all-encompassing search for relevant information. Goal setting prior to engaging in information gathering might limit the scope of search. In other words, individuals may not seek out all relevant information that otherwise may have been sought in the absence of specific goals. A wide-ranging and unrestricted search for relevant and inconsistent information seems to facilitate creative problem-solving (Mumford, Baughman, Supinski et al., 1996). For example, Al-Issa (1972) found that attending to a greater range of information benefits creative performance. Failure to sufficiently search for pertinent facts may then negatively impact the generation of a viable solution. Thus, while there is reason to believe setting a specific learning or performance goal may facilitate information gathering, it also has the potential to limit a more unconstrained search of relevant information and inhibit creative performance. Accordingly, we propose the first set of research questions:

RQ1: *What effect does setting a learning goal have on information gathering and subsequent creative performance?*

RQ2: *What effect does setting a performance goal have on information gathering and subsequent creative performance?*

Information Gathering and Prioritizing

Selectively gathering relevant information is only one facet of information gathering. That is, individuals must also be able to identify and consider *inconsistent* information to advance their creative problem-solving efforts. Decades ago, Kuhn (1970) suggested that

identifying discrepant information and resolving the discrepancy is an important aspect of scientific creativity and discovery. Work by Dunbar (1995) extends this idea as well. A greater focus on information that is inconsistent with initial expectations was found to be related to creative performance in microbiology laboratories. This idea is further supported by Mumford, Baughman, Supinski, et al.'s (1996) research, in which time spent reading different types of information on various cards was examined. Results indicated that participants who spent a greater amount of time reading information pertaining to key facts and taking note of information that was inconsistent with prior observations generated more creative solutions, highlighting that a systematic search for information pertaining to the problem impacts creative performance.

Taken as a whole, prior research suggests that identifying and resolving discrepant information can facilitate the information gathering process and positively impact creative performance. Prioritizing can be a means by which individuals not only identify and consider key facts or anomalies that are inconsistent with other observations, but also discount distracting information. Prioritizing inherently involves giving something(s) more attention before focusing on other alternatives (Firesmith, 2004). As such, when individuals prioritize, they are more likely to focus on key facts and consider inconsistences in information and thus less likely to attend to broad and distal principles, which have been shown to decrease solution quality and originality (Mumford, Baughman, Supinski et al., 1996). More specifically, prompting individuals to prioritize key facts or anomalies (i.e., unusual information) may facilitate identification of inconsistencies and irrelevant information, as both have been shown to contribute to effective execution of creative processes (Mumford & McIntosh, 2017). While searching for key facts can help individuals disregard distracting information, identifying anomalies can help people

consider the implications of unexpected (i.e., anomalous) information and observations, thereby contributing to creative performance (Katz, 1994; Kuhn, 1970; Mumford, 2000).

As goal setting and prioritizing both have the potential to influence how an individual gathers information and engages in creative problem-solving, the present effort affords an interesting opportunity to study the joint influence of goal setting and prioritizing on information gathering and creative performance. Accordingly, we present the following research questions:

RQ3: *What effect does prioritizing key facts (anomalies) have on information gathering and subsequent creative performance?*

RQ4: *What effect does prioritizing key facts (anomalies) have on information gathering and subsequent creative performance when coupled with goal setting?*

Information Gathering and Time Constraints

Regardless of industry, individuals have to frequently perform under time constraints without compromising the quality of outcomes. Very few decisions are made without individuals having to adhere to deadlines, and the creative process is no exception. Time constraints invariably influence information search and integration processes. As an example, Higgins (1999) investigated whether credibility of an information source impacted how the information was used in subsequent decision-making tasks in time constrained and unconstrained conditions. Not surprisingly, time constraints led to individuals being more uncertain in their decisions. Higgins (1999) reasoned that when working with time constraints, individuals may rely more heavily on baseline information in an attempt to reduce cognitive effort.

When faced with time constraints creating pressure, individuals typically respond by increasing information processing efforts, employing simpler information search and decision strategies, or using a combination of both (Edland & Svenson, 1993; Todd et al., 2019).

Examples of simpler strategies include considering fewer factors or assigning more weight to negative factors (Benson & Beach, 1996; Bronner, 1982). The strategy chosen is likely to depend on the complexity of the task, and prior research on the influence of time pressure has predominantly focused on simple tasks. In these instances, a time constraint is less likely to affect outcomes because individuals have a narrow scope of alternatives differing on a limited number of attributes to consider, which allows people to evaluate and weigh all relevant pieces of information prior to execution. (Weenig & Maarleveld, 2002). However, as task complexity increases, the ability to thoroughly process and evaluate information reduces under a time constraint in most situations. Weenig and Maarleveld (2002) examined the effects of time constraints on information search strategies in complex choice tasks. Results indicated that individuals in the time constraint condition adapted to the constraint by giving less attention to all available pieces of information. Compared to participants in the no time constraint condition, they examined approximately half as many items, attended to fewer attributes, gathered information on fewer models, and considered fewer alternatives.

These lines of evidence suggest that when individuals operate under time constraints with complex tasks, they are more likely to use heuristics to structure information gathering. Thus far, goal setting and prioritizing have been discussed as valuable strategies for information gathering and creative performance, in that both may help structure information search and encoding activities. At one level, it then seems goal setting and prioritizing may serve as heuristics guiding an individual's information gathering even in the presence of a time constraint. In other words, if people commit to specific goals or prioritize, the imposition of a moderate time constraint may not necessarily detract from effective information gathering and creative performance. At another level, however, an externally imposed moderate time constraint may have a detrimental

impact on information gathering and creative performance because it is less likely to be viewed as malleable (Medeiros et al., 2014). The fixed nature of a time constraint makes it to where it is not amenable, possibly resulting in individuals feeling the time constraint cannot be readily worked with or around. Accordingly, we present the last set of research questions:

RQ5: *What effect does a time constraint have on information gathering and subsequent creative performance?*

RQ6: *What effect does a time constraint have on information gathering and subsequent creative performance when coupled with goal setting?*

RQ7: *What effect does a time constraint have on information gathering and subsequent creative performance when coupled with prioritizing?*

Method

Sample

This study used a sample of 368 participants (71.5% female) from a large southwestern university. Ages of these participants ranged from 18 to 40 (M = 18.77, SD = 1.62), and participants were predominantly Caucasian (63.9%). They were recruited using SONA, the university's online participant recruitment system and were given course credit to fulfill an educational requirement. Participants were randomly assigned into experimental conditions and completed the study on Qualtrics.

Design and General Procedure

A 2 x 2 x 2 between subjects design was used to manipulate goal setting (learning vs. performance), prioritizing (key facts vs. anomalies), and a moderate time constraint (present vs. absent). Participants were randomly assigned to one of eight experimental conditions. Dependent variables of interest included information gathering (number of key facts, number of anomalies,

and quality) and performance (quality, originality, and elegance) on a creative problem-solving task.

Each session began by participants reading and signing the informed consent form and completing timed covariate measures assessing intelligence and divergent thinking. This was followed by presenting participants with general task materials used in prior creative problem-solving studies, in which participants assumed the role of a New Product Development Manager for a fictional restaurant consulting firm called O'Toole Restaurants (Peterson, 2013; Medeiros et al., 2018). After participants reviewed background information pertaining to the company and their role, they received the goal setting, prioritizing, and time constraint manipulations in the form of emails and proceeded to reading a simulated restaurant report from the National Restaurant Association. After reviewing the report, participants viewed a series of emails to elicit each of the creative processes following problem definition (i.e., information gathering, conceptual selection, conceptual combination, idea generation, idea evaluation) and were asked to provide responses to respective prompts. They were then instructed to develop a final proposal of a new restaurant concept. A final battery of covariate questionnaires assessing personality, expertise, motivation, goal orientation, epistemic curiosity, and demographics was completed. To conclude, participants completed a manipulation check questionnaire and were debriefed. The study took participants approximately 70 minutes to complete.

Experimental Task

Prior research has shown that undergraduate students frequently eat and/or work at restaurants, suggesting familiarity with the restaurant industry (Debevec et al., 2013; National Restaurant Association, 2012, 2013). The restaurant task was specifically chosen for this study

given the importance of expertise for information gathering and creative performance (Mumford, Baughman, Supinski et al., 1996).

The experimental task was delivered through a series of emails, which all came from the fictitious company's Vice President of Research and Development. The first email welcomed the participant and included information on the company history and a job description detailing the title, department, duties, and reporting structure. Following this, participants received an email describing a new project, which entailed creating a new restaurant concept using the consulting firm's knowledge and experience. It was explained that this project stemmed from a recent research study examining the outlook for the restaurant industry in the next five years, and participants were told they would be able to review a report from the National Restaurant Association shortly. Prior to proceeding to the report, goal setting, prioritizing, and time constraint manipulations were embedded within the following emails depending on the assigned experimental condition.

The report included extensive information about the research study and relevant details pertaining to important restaurant attributes such as customer experience, service approach, and cuisine. For example, a good customer experience can be "created by both the food and beverages offered and such things as the theme (e.g., sports, trendy, ethnic), look, feel, lighting, furniture, music, staff uniforms, and more." A service approach entails aspects of "where food products are purchased, how food is prepared, how food moves from the kitchen to the customer, restaurant location, and more." Lastly, cuisine involves considering "the type of food and beverages served in a restaurant" and other factors such as "where and how ingredients are obtained and the style of the food (e.g., traditional or contemporary)." After reviewing the report, participants received emails specific to each of the creative processes and provided responses.

They then received a final email requesting the proposal of a new restaurant concept that the Vice President would present to the executive board.

Manipulations

Goal setting. The goal setting manipulation was in the form of an email participants received from the Vice President after being tasked with creating a new concept but before proceeding to review the restaurant report. Participants were told that the executive board would like for you to consider the following prior to reading the report from the National Restaurant Association. The email delineated how goals can be used to provide a sense of purpose and how committing to a goal can enhance effort, persistence, and guide search strategies to achieve the goal (Locke & Latham, 1990, 2009). This was then followed by the specific learning or performance goal. In the learning goal condition it stated, "Your goal is to *master knowledge* pertaining to this task. With that said, consider what *information you need to gather and understand* about the restaurant industry to develop your restaurant concept." This goal focused participants' attention on considering the type of information that would need to be understood about the restaurant industry in general during the information gathering process. In other words, it provided an opportunity for individuals to focus on examining and analyzing available information that was relevant to the task, which would help facilitate goal attainment and performance (Seijts & Latham, 2005). In the performance goal condition it stated, "Your goal is to develop *the best restaurant concept* the executive board has ever seen. With that said, consider what information you will need to make your restaurant *successful*." This goal set participants up to explicitly reflect on what will be important to consider for the final outcome of creating a concept resulting in restaurant success.

Prioritizing. The prioritizing manipulation was also in the form of an email participants received from the Vice President after the goal setting email. The email stated there is a lot of information available on factors to consider in the creation of a new restaurant concept and some factors should be given more emphasis than others. In the prioritizing key facts condition participants were then told, "As you read the report next and gather information, please prioritize *KEY FACTS* that are most important for your restaurant concept." In the prioritizing anomalies condition participants were told, "As you read the report next and gather information, please prioritize *UNUSUAL* information that could be used in your restaurant concept."

Time constraint. The time constraint manipulation was created by imposing a moderate time limit as participants reviewed the report from the National Restaurant Association. This was set to be 30% below the average time it took to review the materials based on a pilot study using an undergraduate student sample (N = 31), amounting to three and a half minutes. In the time constraint present condition, participants were notified of this time limit in the same email containing instructions on what information to prioritize. They were specifically told, "You have a limited amount of time to read through the report, so use it wisely." In the time constraint absent condition, participants were allowed to take as much time as they needed to review the information. Prior studies have used this manipulation, and it has been demonstrated to induce perceptions of pressure (Barrett et al., 2011)

Dependent Measures

Information gathering. The information gathering email stated, "Before moving forward with this project, the board members would like some more information from you, as they want to be sure that O'Toole Restaurant Inc. does not commit to a new project too hastily.

That being said, please list key information you think should be attended to as we move forward. In other words, let us know what information is the most important to pay attention to." Participants were also told not to feel limited to the report presented earlier. Number of key facts, number of anomalies, and quality of information gathered were rated using a 5-point benchmark rating scale procedure. Number of key facts refers to a numerical count of each distinct fact identified from the restaurant report, and number of anomalies refers to a numerical count of each unique piece of information identified from the report. Quality is the extent to which the information gathered by the participant was comprehensive, relevant to the scenario, considered critical aspects of the scenario, and was realistic. Low- and high-quality responses were selected from participant data for each scale to create final benchmarks. Three undergraduate research assistants were trained on rating procedures and assisted with this effort. The interrater reliabilities (r^*_{wg}) for number key facts, number of anomalies, and quality were .96, .99, and .94, respectively.

Creative performance. The creative problem-solving task required participants to prepare a final proposal of a new restaurant concept that the Vice President would present to the executive board. The final proposal was coded for quality, originality, and elegance using a 5-point benchmark rating scale procedure used in previous studies (Osburn & Mumford, 2006; Friedrich & Mumford, 2009; Connelly & Ruark, 2010). Quality is the degree to which the proposed solution was realistic, practical, and appropriate for the situation. Originality refers to the extent to which the participant drafted a novel solution, and elegance is the extent to which the solution was articulated in a concise manner. Once again, low- and high-quality responses were selected from participant data for each scale to create final benchmarks. Three separate undergraduate research assistants were trained on rating procedures and assisted with this effort.

The interrater reliabilities (r^*_{wg}) for quality, originality, and elegance were .85, .86, and .84, respectively.

Covariates

A number of theoretically relevant follower attributes were expected to influence information gathering and creative performance and therefore were taken in consideration. Covariates included intelligence, divergent thinking, personality, expertise, motivation, goal orientation, epistemic curiosity, and performance as well as time spent on subsequent creative process prompts (i.e., conceptual selection, conceptual combination, idea generation, and idea evaluation).

Intelligence was measured using the Employee Aptitude Survey (Ruch & Ruch, 1980). Test-retest reliabilities for this measure have been demonstrated to be above .80 (Grimsley et al., 1985). Divergent thinking was assessed using the Guildford's Consequences measure (Merrifield et al., 1962). Prior studies have shown internal consistency coefficients for this measure to be in the .70s (Medeiros et al., 2014). Personality was measured using the Five Factor Model Questionnaire (agreeableness $\alpha = .89$, conscientiousness $\alpha = .81$, openness $\alpha = .75$, extraversion $\alpha = .85$, neuroticism $\alpha = .76$; Gill & Hodgkinson, 2007). Expertise was assessed through a restaurant interest measure used previously ($\alpha = .72$; Medeiros et al., 2018). Motivation was assessed using the Need for Cognition scale ($\alpha = .88$; Cacioppo et al., 1984). Goal orientation was measured using the Goal Orientation Scale (learning goal orientation $\alpha = .87$, avoid goal orientation $\alpha = .84$, prove goal orientation $\alpha = .71$; Vandewalle, 1997), and epistemic curiosity was assessed using the Epistemic Curiosity Scale ($\alpha = .88$; Litman & Spielberger, 2003). Undergraduate research assistants trained on rating procedures assisted with coding efforts for each of the subsequent creative processes. Low- and high-quality responses were selected from

participant data for each scale to create final benchmarks. Conceptual selection was rated for number of key causes, number of key constraints, number of user groups, and quality. Interrater reliabilities (r^*_{wg}) for these ratings are .96, .98, .98, and .96, respectively. The remaining creative processes were rated for quality and originality. Interrater reliabilities for quality and originality, respectively, are as follow: conceptual combination = .93 and .95, idea generation = .89 and .91, and idea evaluation = .86 and .88. The ratings were averaged to generate an overall performance score for each process. An overall average was also calculated for time spent on these creative processes. Finally, participants provided demographic information relating to age, gender, ethnicity, English proficiency, major, and year in college.

Analyses

Research questions were investigated using analysis of covariance (ANCOVA). Main and interactive effects of goal setting, prioritizing, and a moderate time constraint were tested for each dependent variable of interest. Correlations were used to determine the set of covariates that would be influential to analyses. The analyses were first performed with the entire set of covariates. Only significant covariates were retained. Table 1 displays the descriptive statistics and correlations among the dependent and covariate variables.

[Insert Table 1 Here]

Based on ANCOVA results, a follow-up exploratory analysis was conducted, where a moderated mediation model was tested using the "PROCESS" macro, model 7, in SPSS version 25 (Hayes, 2013). More specifically, goal setting was the predictor variable, quality of information gathered was the mediator, time was the moderator, and the quality, originality, and elegance of the final proposal were outcome variables. The significance of the indirect (i.e., mediated) effects moderated by time (i.e., conditional indirect effects) were tested. This model

explicitly tested the moderating effect of time on the path from goal setting to quality of information gathered. Figure 1 displays an example conceptual model.

[Insert Figure 1 Here]

Results

Manipulation Checks

Participants completed manipulation checks to assess the extent to which they perceived each manipulation by rating items on a 5-point Likert scale ranging from 1 (strongly disagree) to 5 (strongly agree). Manipulation checks were tested using independent samples *t*-tests. Participants that were assigned a learning goal generally perceived they were asked to master knowledge or consider the information needed to gather and understand about the restaurant industry ($M = 3.77$, $SD = .69$, $p < .05$) more than those that were assigned a performance goal ($M = 3.59$, $SD = .66$). Participants that were asked to prioritize anomalies generally perceived they were asked to focus more on unusual information ($M = 3.45$, $SD = .96$, $p < .01$) than those that were asked to focus on key facts ($M = 2.69$, $SD = 1.06$). Lastly, participants in the moderate time constraint condition reported perceiving greater time pressure ($M = 3.27$, $SD = 1.00$, $p < .01$) than those in the untimed condition ($M = 2.66$, $SD = .88$).

Analysis of Covariance (ANCOVAs)

Information gathered. Information gathered was measured by rating a) the number of key facts, b) the number of anomalies, and c) the quality of the information gathered. No main or interactive effects of goal setting, prioritizing, or time constraints were found for the number of key facts or anomalies considered. Using Cohen's (1988) guidelines for effect sizes, where partial eta squared values of .01, .06, and .14 are indicative of small, medium, and large effects, we found a small effect size of time on the quality of information gathered $F(1, 356) = 4.95$, $p <$

.05, η_p^2 = .01, such that when participants were not timed when reading the restaurant report (*M* = 2.62, *SE* = .07), they gathered information higher in quality than those in the timed condition (*M* = 2.41, *SE* = .07) after controlling for intelligence, divergent thinking, agreeableness, and prove goal orientation. Further, there was a significant interaction of goal setting and time on the quality of information gathered $F(1, 356) = 4.12$, $p < .05$, $\eta_p^2 = .01$, such that when participants were assigned a performance goal and were not timed when reading the restaurant report (*M* = 2.77, *SE* = .09), they gathered information higher in quality compared to when they received a learning goal and were not timed (*M* = 2.47, *SE* = .09). See Table 2.

[Insert Table 2 Here]

Creative performance. Creative performance was measured by rating the a) quality, b) originality, and c) elegance of the final restaurant proposal. No main or interactive effects of goal setting, prioritizing, or time constraint were found for the quality, originality, or elegance of the final proposal. See Table 3.

[Insert Table 3 Here]

Moderated Mediation

Recall the creative process model consists of eight interrelated processes, whereby information gathering is the second process (Mumford et al., 1991). The quality of information gathered was significantly and positively correlated with final proposal quality (*r* = .46), originality (*r* = .39), and elegance (*r* = .40) at $p < 01$. Given these relationships and the significant interaction of goal setting and time on the quality of information gathered, a follow-up exploratory analysis was performed to examine whether there was a moderated mediation effect of goal setting on the final proposal through quality of information gathered depending on the presence or absence of a moderate time constraint.

Table 4 shows the unstandardized results of the moderated mediation model. Consistent with results from the ANCOVA, results revealed a significant interaction of goal setting and time on the quality of information gathered (ΔR^2 = .01, F(1, 360) = 4.11, p < .05). When participants were assigned a performance goal and were not timed, the quality of information gathered was significantly higher (b = -.30, SE = .13, t = -2.29, p < .05) than when they were timed (b = .07, SE = .13, t = .56, p = .58). Next, the significance of indirect effects of goal setting on quality, originality, and elegance of the final proposal through quality of information gathered at each level of the moderator (time and untimed) were examined. Table 5 displays these conditional indirect effects. Testing for significant differences in these conditional indirect effects enabled a determination of whether the indirect effects of goal setting through quality of information gathered were contingent on whether participants were timed or not timed when reading the restaurant report (moderated mediation). Results revealed that when comparing the presence or absence of a moderate time constraint, there was a significant difference in the indirect effects of performance goal setting through the quality of information gathered on final proposal quality (index = .16, SE = .08, 95% CI = .01, .32), originality (index = .11, SE = .05, 95% CI = .00, .22), and elegance (index = .14, SE = .07, 95% CI = .00, .28), providing support for a moderated mediation effect. When participants were not timed, the indirect effects of a performance goal through quality of information gathered were significant on final proposal quality (ab = -.13, SE = .06, 95% CI = -.24, -.02), originality (ab = -.08, SE = .04, 95% CI = -.17, -.01), and elegance (ab = -.11, SE = .05, 95% CI = -.21, -.01). Note these results were found after controlling for the same set of covariates that were significant in the ANCOVA analyses. When participants were timed, the indirect effects of performance goal setting through quality of information gathered were non-significant (see Table 5).

[Insert Tables 4 & 5 Here]

Discussion

Although existing literature suggests there are positive effects of setting specific goals on performance, little is known about the influence of setting specific learning and performance-oriented goals in the context of information gathering and subsequent creative performance. Additionally, research to date lends support to the importance of identifying not only relevant, but also inconsistent information during the information gathering stage of the creative process model. However, little research has investigated how prompting individuals to prioritize key facts versus anomalies can influence the search process, with a focus on key facts helping to narrow their focus on important pieces of information and a focus on anomalies potentially boosting original thinking. Finally, because time is a limited resource in organizations and time constraints have the potential to influence both the quality of information gathered and creative performance outcomes, it was of value to examine the effect of a moderate time constraint. The present effort sought to address these gaps and afforded the opportunity to examine interactions between goal setting, prioritizing, and time constraints on information gathering and creative performance.

Findings from this effort revealed that when individuals were not timed when reviewing the restaurant report, the quality of the information gathered was significantly better. This is consistent with prior research suggesting time constraints create pressure, resulting in individuals attempting to enhance information processing efforts by relying on simpler information and decision strategies (Edland & Svenson, 1993). The restaurant report used in the present effort detailed a number of important restaurant attributes that are important to consider when creating a new restaurant. It stands to reason that when individuals were not under a time constraint, they

were able to *thoroughly* process and evaluate different pieces of information in the report, helping them gather information that was more comprehensive and higher in utility for the task at hand compared to individuals that perceived time pressure (Fichtel & Mumford, 2023). However, imposition of a moderate time constraint did not impact the number of key facts or number of anomalies considered during information gathering. This non-significant finding is of interest because it contrasts with some prior findings suggesting perceptions of time pressure can lead to individuals evaluating fewer factors or assigning more weight to certain pieces of information over other types (Benson & Beach, 1996; Bronner, 1982). Taken together, these findings suggest that although the overall quality (i.e., comprehensiveness, coherence, usefulness) and integration of gathered information is likely to suffer when individuals are faced with a time constraint, consideration of individual key facts and anomalies in the information gathered is less likely to be affected.

Moreover, this study found that time and goal setting have a joint influence on the quality of information gathered. When individuals were assigned a performance goal and were not timed when reading the restaurant report, the quality of information gathered was higher. That is, when a time constraint is not imposed, assigning a performance goal to individuals can not only help direct the process of gathering information, but also enable individuals to remain focused on gathering information that is realistic, practical, and appropriate. A performance-oriented goal heavily emphasizes performance (Seijts & Latham, 2005). Similarly, the performance-oriented goal in this study was framed in a manner that emphasized results. Individuals were instructed to develop the best restaurant concept the executive board has ever seen and consider the information needed to make their restaurant successful. In other words, the assigned performance-oriented goal had a greater focus on results, while the learning-oriented goal was

framed to focus participants' attention on mastering knowledge pertaining to the task and considering the information needed to gather and understand to create their restaurant. Therefore, when individuals do not perceive time pressure, framing a goal in terms of a demand or expected success as opposed to instructing individuals to simply master knowledge can enhance the overall quality of information gathered.

Prompting individuals to prioritize key facts or anomalies did not impact the number of key facts or anomalies considered in the information gathered or the overall quality of it. This finding is somewhat inconsistent with what prior research suggests, as identifying relevant and inconsistent information has been shown to facilitate the information gathering process (Mumford, Baughman, Supinski et al., 1996). A plausible explanation for this finding is that because individuals are already likely to examine key facts and anomalies on their own due to the importance and salience of critical and unusual information, prompting individuals to consider either type of information further will not significantly impact information gathered. In other words, because individuals are inherently motivated to focus on important and anomalous information, further instructing them to prioritize key facts or unconventional information is not likely to incrementally impact information gathering.

Although this study did not find any direct or interactive effects of goal setting, prioritizing, or time constraints on final proposal quality, originality, and elegance, follow-up analyses revealed interesting results. A significant moderated mediation effect was found, such that when a time constraint was not imposed, setting a performance-oriented goal significantly impacted creative performance through the quality of information gathered. Put differently, goal setting was found to operate through quality information gathering to influence creative performance when individuals were not timed. These results extend on the significant interaction

found between a performance goal and absence of a time constraint on the quality of information gathered. That is, not only does assigning a performance goal framed in terms of a demand impact the quality of the information gathered, but this then impacts overall creative performance when individuals are not timed. Under these circumstances, individuals generated a final proposal that was higher in quality (complete, useful), originality (novel), *and* elegance (refined).

Theoretical and Practical Implications

Findings from this effort offer a number of theoretical and practical implications. First, results contribute to the creativity and constraints literature. While prior research in this domain has examined the effects of fundamental, theme, and technology constraints (Hughes, 1989; Medeiros et al., 2014), this study investigated the influence of common organizational constraints on performance previously understudied and their impact on the information gathering stage of the creative process model. Consistent with goal-setting theory suggesting a performance goal is effective when individuals are equipped with the knowledge needed to perform the task, findings from this study revealed a performance goal as opposed to a learning goal facilitated better information gathering when individuals were not timed. Because prior research has shown undergraduates frequently dine and/or work at restaurants (Debevec et al., 2013; National Restaurant Association, 2012, 2013), it stands to reason participants had the expertise needed to effectively gather information despite the performance goal being framed in terms of driving results. Further, although goal setting and a time constraint did not have a direct effect on overall creative performance, this study found evidence for moderated mediation. Setting a performance goal was shown to improve final proposal quality, originality, and elegance *through* quality information gathering when participants were not timed, addressing a gap in the information gathering and creativity literature.

Imposing a time limit, arguably one of the most common organizational constraints on performance, detracted from quality information gathering. At one level, this finding is not entirely surprising as time pressure has been shown to cause distress, impacting decision-making and subsequent performance. At another level, however, this finding is somewhat unexpected due to the time constraint being *moderate* in nature. The time constraint imposed was set to be only 30% below the average time it took an individual to review the restaurant report. Given that this constraint nonetheless impacted the comprehensiveness and utility of information gathered underscores the importance for organizations to adopt interventions that can help offset time pressure for employees. For example, organizations may consider implementing a training that equips individuals with strategies to manage their time more effectively. While it is not possible to eliminate deadlines entirely, providing employees with tools to better operate under imposed time constraints can help mitigate many of the detrimental effects resulting from time pressures. Finally, the moderated mediation finding has important implications for organizations as well. Simply assigning a performance goal and either not imposing a time constraint or attempting to reduce perceptions of time pressure are not likely to be sufficient for improving overall creative performance. After assigning a performance goal, ensuring that individuals engage in quality information gathering early in the creative process will help them produce solutions that are not only more thorough and practical, but also more novel and refined. This means that for large-scale projects, it may be beneficial for managers to consider having a meeting with subordinates to review the type and scope of information gathered prior to proceeding to next steps.

Limitations

Despite the utility of these findings, a few limitations should be addressed. First, this study employed a low-fidelity simulation in which participants assumed the role of a New

Product Development Manager for a fictional restaurant consulting firm. Although this simulation has successfully been employed in prior research and has been shown to exert effects (e.g., Medeiros et al., 2018), the extent to which these findings generalize to creative professionals in an organizational setting is unclear. Second, this study only focused on one early cycle creative process and examined a single type of creative problem-solving task specific to the restaurant industry. As mentioned previously, expertise has been shown to be important for information gathering and creative performance (Mumford, Baughman, Supinski et al., 1996). Therefore, creative performance with respect to other domains may differ when individuals lack the necessary expertise needed to generate well-developed solutions. Third, participants were asked to go through various stages of the creative process and generate a solution in a relatively short window of time. In an organizational setting, creative work unfolds over a significant period of time, allowing individuals the opportunity to revisit earlier stages in the creative process if necessary. Thus, results may differ when individuals have considerably more time to generate a creative solution. Finally, information gathering was constrained in this study, such that participants were limited to the information presented in the restaurant report. In the real-world, individuals have the ability to readily seek out additional information if desired, potentially impacting creative performance.

Future Directions

This study presents several fruitful avenues for future research. In this study, participants were either assigned a learning or a performance-oriented goal. Future research may consider examining the influence of setting both types of goals on the quality of information gathered. For example, setting a learning goal in tandem with a performance goal may particularly be beneficial when individuals do not possess the knowledge and ability needed to perform the task.

Additionally, given the pivotal role of information gathering in the creative process, it is valuable to study the impact of other types of constraints to understand how they might enhance or detract from quality information gathering. This will also afford the opportunity to investigate whether the constraints have a direct influence on creative performance or if they operate through information gathering. Finally, future research should attempt to study information gathering longitudinally. Creative solutions can develop overtime and recall the creative process model is dynamic in nature, allowing individuals to revisit earlier stages of the process if they are not successful in executing a particular process (Mumford et al., 1991; Mumford et al., 2012). A longitudinal design can provide insight into if and how often people revisit the information gathering stage to inform and successfully execute subsequent processes, thereby impacting the quality, originality, or elegance of the final solution.

Conclusion

The information gathering stage of the creative process model has historically received less attention compared to other stages (Mumford, Baughman, Supinski et al., 1996). Findings from the present effort suggest imposing a time constraint can detract from the quality of information gathered. Results also highlight how constraints can interact to influence information gathering, such that the quality of information gathered is better when individuals are assigned a performance goal and do not perceive time pressure. Finally, this study sheds light on how constraints might operate through information gathering to influence creative outcomes. Specifically, it was found that assigning a performance goal can lead to higher quality, originality, and elegant solutions through quality information gathering when individuals are not faced with a time constraint. In conclusion, this research equips practitioners and researchers with a better understanding of how common organizational constraints on performance can

impact information gathering and subsequent creative performance. Several avenues are provided for future research in pursuit of advancing creativity and constraint literatures.

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Tables and Figures

Table 1

Descriptive Statistics and Correlations among Dependent and Covariate Variables

	M	*SD*	*1*	*2*	*3*	*4*	*5*	*6*	*7*	*8*	*9*	*10*	*11*	*12*	*13*	*14*
1. Intelligence	24.4	7.89	-													
2. Divergent Thinking	6.41	2.33	.07	-												
3. Agreeableness	64.5	9.22	.03	.03	-											
4. Prove Goal Orientation	3.88	.90	-.02	.12*	-.07	-										
5. Conceptual Selection	1.91	.59	.24**	.19**	.01	.07	-									
6. Conceptual Combination	2.54	.85	.36**	.23**	.14**	-.01	.49**	-								
7. Idea Generation	1.81	.68	.19**	.16**	.10*	-.03	.32**	.47**	-							
8. Idea Evaluation	1.77	.66	.23**	.11*	.06	-.02	.35**	.55**	.65**	-						
9. Information Gathering - Number of Key Facts	3.82	1.33	.25**	.23**	.11*	.09	.42**	.43**	.26**	.23**	-					
10. Information Gathering - Number of Anomalies	1.09	.38	.00	.02	.05	.01	.07	.18**	.13*	.15**	.10	-				
11. Information Gathering - Quality	2.51	.93	.19**	.21**	.13*	.13*	.40**	.51**	.41**	.39**	.59**	.27**	-			
12. Creative Performance - Quality	2.46	1.00	.29**	.21**	.10*	.01	.42**	.61**	.57**	.62**	.33**	.14**	.46**	-		
13. Creative Performance - Originality	1.73	.71	.18**	.16**	.03	.00	.33**	.54**	.60**	.61**	.22**	.16**	.39**	.74**	-	
14. Creative Performance - Elegance	2.20	.99	.26**	.18**	.11*	.01	.38**	.57**	.60**	.66**	.27**	.13*	.40**	.90**	.75**	-

Note. $N = 368$. $^{*}p < .05$; $^{**}p < .01$. Intelligence, divergent thinking, agreeableness, prove goal orientation, conceptual selection, conceptual combination, idea generation, and idea evaluation are covariates. Conceptual selection, conceptual combination, idea generation, and idea evaluation reflect composite scores obtained from averaged ratings.

Table 2

ANCOVA Results of Goal Setting, Prioritizing, and Time Constraints on Information Gathering

	Number of Key Facts			Number of Anomalies			Quality		
	F	*p*	η_p^2	*F*	*p*	η_p^2	*F*	*p*	η_p^2
Corrected Model	5.14	.00**	.11	.78	.61	.02	5.01	.00**	.13
Intercept	58.46	.00**	.14	2968.71	.00**	.89	.38	.54	.00
Intelligence	21.14	.00**	.06	-	-	-	13.89	.00**	.04
Divergent Thinking	16.97	.00**	.05	-	-	-	11.57	.00**	.03
Agreeableness	-	-	-	-	-	-	5.91	.02*	.02
Prove Goal Orientation	-	-	-	-	-	-	5.83	.02*	.02
Goal Setting	.23	.63	.00	.74	.39	.00	1.47	.23	.00
Prioritization	2.04	.16	.01	.01	.93	.00	.79	.38	.00
Time	.08	.78	.00	2.22	.14	.01	4.95	.03*	.01
Goal Setting x Prioritization	.05	.82	.00	2.12	.15	.01	.48	.49	.00
Goal Setting x Time	.04	.84	.00	.24	.63	.00	4.11	.04*	.01
Prioritization x Time	.10	.76	.00	.08	.78	.00	.09	.76	.00
Goal Setting x Prioritization x Time	.26	.61	.00	.03	.86	.00	.55	.46	.00

Note. $N = 368$. $^{*}p < .05$; $^{**}p < .01$. Intelligence, divergent thinking, agreeableness, and prove goal orientation are covariates. Dashes indicate instances where the specific variable was not used as a covariate.

Table 3

ANCOVA Results of Goal Setting, Prioritizing, and Time Constraints on Final Creative Performance

	Quality			Originality			Elegance		
	F	*p*	η_p^2	*F*	*p*	η_p^2	*F*	*p*	η_p^2
Corrected Model	37.09	.00**	.53	35.12	.00**	.50	41.96	.00**	.54
Intercept	1.15	.28	.00	.33	.57	.00	2.74	.10	.01
Conceptual Selection	7.41	.01**	.02	-	-	-	-	-	-
Conceptual Combination	41.59	.00**	.11	30.40	.00**	.08	37.28	.00**	.10
Idea Generation	17.26	.00**	.05	39.01	.00**	.10	26.30	.00**	.07
Idea Evaluation	31.40	.00**	.08	25.66	.00**	.07	49.33	.00**	.12
Goal Setting	1.53	.22	.00	.00	.98	.00	1.77	.19	.01
Prioritization	.00	.95	.00	.02	.89	.00	.02	.89	.00
Time	1.39	.24	.00	1.98	.16	.01	2.64	.11	.01
Goal Setting x Prioritization	1.95	.16	.01	.66	.42	.00	.93	.34	.00
Goal Setting x Time	.01	.93	.00	.21	.65	.00	.95	.33	.00
Prioritization x Time	.01	.92	.00	3.13	.08	.01	.05	.82	.00
Goal Setting x Prioritization x Time	.02	.89	.00	.20	.66	.00	.20	.65	.00

Note. $N = 368$. $^{*}p < .05$; $^{**}p < .01$. Conceptual selection, conceptual combination, idea generation, and idea evaluation are covariates. Dashes indicate instances where the specific variable was not used as a covariate.

Figure 1

Example Conceptual Model

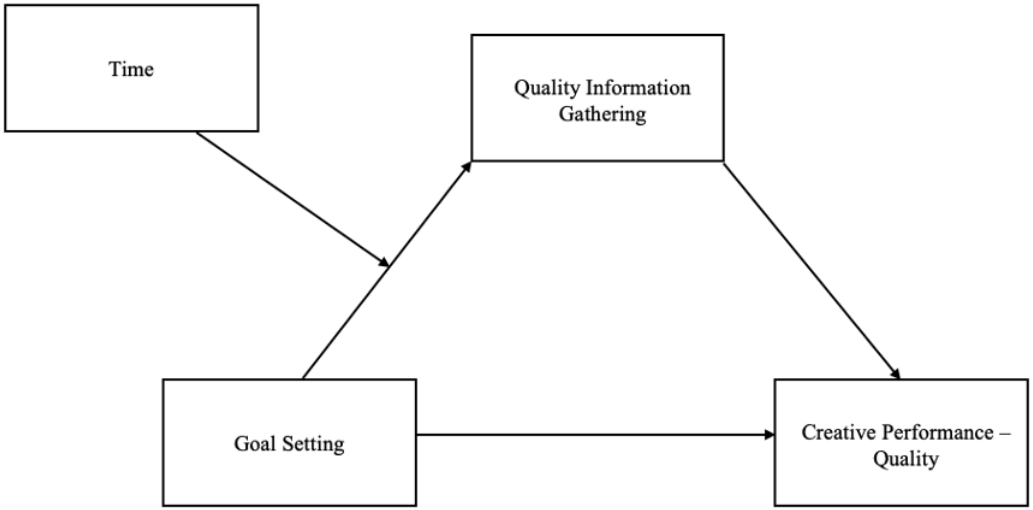

Table 4

Unstandardized Coefficient Estimates for the Mediation Model with Quality Information Gathering Mediator

	Mediator: Quality Information Gathering			DV: Creative Performance – Quality			DV: Creative Performance – Originality			DV: Creative Performance – Elegance		
Variable	*b*	*SE*	*t*	*b*	*SE*	*t*	*b*	*SE*	*t*	*b*	*SE*	*t*
Constant	.52	.43	1.20	.36	.42	.87	.92**	.32	2.92	.24	.43	.56
Goal Setting (Performance)	-.30*	.13	-2.29	-.04	.09	-.43	.04	.07	.61	-.05	.09	-.57
Time (Constraint Absent)	-.39**	.13	-3.00									
Goal Setting x Time	.37*	.18	2.03									
Intelligence	.02**	.01	3.86	.03**	.01	4.38	.01*	.00	1.95	.02**	.01	3.93
Divergent Thinking	.07**	.02	3.50	.05**	.02	2.65	.03	.02	1.78	.04*	.02	2.13
Agreeableness	.01*	.01	2.42	.00	.01	.87	-.00	.00	-.58	.01	.01	1.14
Prove Goal Orientation	.12*	.05	2.34	-.05	.05	-.97	-.04	.04	-1.13	-.04	.05	-.78
Quality Information Gathering				.42**	.05	8.26	.28**	.04	7.27	.36**	.05	6.92
R^2		.13			.27			.18			.21	
F		7.64**			22.12**			12.81**			16.21**	

Note. $N = 368$. $^{*}p < .05$; $^{**}p < .01$. Intelligence, divergent thinking, agreeableness, and prove goal orientation are covariates.

Table 5

Conditional Indirect Effects and Moderated Mediation Indices for the Mediation Model with Quality Information Gathering

Variable	Time Constraint Absent		Time Constraint Present		Index of Moderated Mediation	
Path	*ab*	95% CI	*ab*	95% CI	Index	95% CI
Performance Goal Setting → Quality Information Gathering → Creative Performance Quality	**-.13**	-.24, -.02	.03	-.07, .14	**.16**	.01, .32
Performance Goal Setting → Quality Information Gathering → Creative Performance Originality	**-.08**	-.17, -.01	.02	-.05, .09	**.11**	.00, .22
Performance Goal Setting → Quality Information Gathering → Creative Performance Elegance	**-.11**	-.21, -.01	.03	-.06, .12	**.14**	.00, .28

Note. Performance goal = 0; Learning goal = 1; *ab* = conditional indirect effect; index = difference between conditional indirect effects. Significant effects are bolded and indicated by 95% confidence intervals that exclude zero.