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**Relationship between Employee's Innovation (Creativity) and time management**

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**Abstract**

The article investigates the relationship between time management behaviours and attitudes with measures of creativity, as assessed by self-rated creativity and a measure of creative personality. Additionally, total creativity is examined, as the sum of the two creativity constructs when z-scored. Using data from a survey of 216 participants, results suggest that creativity is positively related to daily planning behaviour, confidence on long-range planning, perceived control of time and tenacity and negatively related to preference for disorganization. These results have theoretical implications for understanding how creativity relates to time management. Implications of the results are considered and future research directions identified.

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**Keywords**: Innovation, Creativity, Time management, Disorganization, Tenacity

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1. Introduction

In today’s rapidly changing environment and expanding global competition there is a continuing and ever-growing recognition on creativity, innovation and the management of time. Creativity is considered as a key to personal and organizational social prosperity;
creativity signifies the production of novel and useful ideas, and marks the starting point for innovation and entrepreneurship (Amabile, 1996; Zampetakis & Moustakis, 2006). Time, on the other hand, represents a commodity that needs to be efficiently managed, not to mention that, more often than not, effective time management is a key indicator of organizational competitive edge (Claessens, van Eerde, Rutte, & Roe, 2007).

Early research on creativity has demonstrated that time is an important resource (Wallas, 1926). Time for instance, is important for incubation; individuals should be given sufficient time if they are expected to do creative work (Runco, 2007). According to Mednick (1962), original ideas tend to be remote and are usually found far away from the original problem or initial idea. This remoteness requires time; it takes time to move from idea to idea to idea, and to find the remote associate. Although time has been frequently used as a variable or as an implied dimension in creativity research, no empirical studies to date have been undertaken to integrate knowledge about the relation of time management with creativity. Empirical evidence on the relationship between creativity and time has been limited basically to the effects of time pressure to creative outcomes in organizations (Amabile, Conti, Coon, Lazenby, & Herron, 1996; Amabile, Mueller, Simpson, Hadley, Kramer, & Fleming, 2002). Researchers have paid scant attention to the relationship between individual creativity and individual time management practices. Considering the importance of creativity and time management, the gap in research and literature on the relationship between individual creativity and time management practices forms a notable deficiency. To address the aforementioned gap, the purpose of this exploratory study was to examine two different measures of creativity; the Creative Personality Scale (CPS: Gough, 1979) and a measure of self-rated creativity adapted from Zhou and George (2001), in relation to time management behaviors (daily planning and confidence on long-range planning) and attitudes (perceive control of time, tenacity and preference for disorganization).

The study contributes to theory and research in that it is the first study that develops and empirically examines a framework for the relationship between time management practices and attitudes and creativity. The remainder of the paper is structured as follows: First, we review previous literature on individual creativity and time management and set out the objectives of the study. Next, we report the results from a cross-sectional study designed to test our model using a sample of 186 randomly selected business, engineering and science students. The paper ends with a discussion of the implications, the limitations and future research.

2. Theoretical background and literature review

2.1. The concept of the individual creativity

There is a consensus in the literature that the phenomenon termed individual creativity is a highly complex one and the measurement of creativity has been a persistent source of debate and critique (Feist, 1998; Runco, 2007). Creativity can be conceived as a product, person,
press or process (Amabile, 1996; Runco, 2007) or as the interaction among “aptitude, process, and environment” (Plucker, Beghetto, & Dow, 2004).

According to Eysenck (1995), creativity is conceived as a latent trait underlying creative behaviour. Old hamand Cummings (1996) demonstrated that an individual is likely to have high creative output if she has the personality traits of a creative person. One limitation however, with the research on personality and creativity is that it is not domain specific but rather covers individuals in general. Recent studies however, suggest the domain-specificity of personality variables with regards to creativity (e.g. Baer, 1998). Feist (1998) for instance, argued that, although personality dispositions do regularly and predictably relate to creative achievement in art and science, there appears to be temporal stability of these distinguishing personality dimensions of creative people; creative artists and creative scientists do not completely share the same unique personality profiles. One of the most widely used constructs of the creative personality (Hocevar, 1981; Oldham & Cummings, 1996), is Gough’s Creative Personality Scale (CPS; Gough, 1979) for the Adjective Check List. CPS assesses aspects of the creative personality that have been demonstrated to relate to rated creativity (Gough, 1979).

Additionally, creativity can be considered as the production of ideas, products, or procedures that are (a) novel and (b) potentially useful or practical (Amabile, 1996; Zhou & George, 2001). This approach is product oriented and focuses on the extent to which outcomes are creative. Several researchers have proposed that self-rated creativity provides a valid approximation of individual creativity (Batey & Farnham, 2008; Zampetakis, 2008). This argument is in line with evidence that creative people possess insight into or awareness of their own creativity (Batey & Furnham, 2008). It is plausible that individuals should be able to recognize whether they are able to produce novel and useful ideas or products (i.e. their own creativity), to a certain degree. Zhou and George (2001) introduced a self-rated measure in line with the product oriented approach to creativity. In the present study we use both the CPS and Zhou and George’s constructs to assess individual creativity. Furthermore the sum of the two measures (when z-scored) was used as the total individual creativity.

2.2. The concept of time management

Broadly speaking, time management refers to activities that imply an effective use of time that is deemed to facilitate productivity and alleviate stress. A common feature among the conceptualizations of time management is “planning behaviour” (Claessens et al., 2007). Planning behaviour refers to decisions about which tasks to perform, prioritization of tasks and effectively management of possible distractions (Claessens, van Eerde, Rutte, & Roe, 2004, 2007). Time management, as planning behaviour, can be considered a particular way of goal setting. Goals may increase attention and effort (i.e. motivation) by providing clear targets toward which individuals can direct their energies (Locke & Latham, 1990).

Britton and Tesser (1991) proposed that engaging in time management behaviours may be viewed as an individual difference in planning behaviour skills such as, short-range planning and preference for long-range planning. Short-range planning refers to time management activities within a daily or weekly timeframe. Preference for long-range planning refers to
having long-range goals and having well-organized work habits. Macan (1994), propose that effective use of time results from three types of behaviours, namely: (1) setting goals and priorities; (2) mechanics of time management (i.e. making lists); and (3) preference for organization.

In addition to the aforementioned behavioural aspects of time management, both Britton and Tesser (1991) and Macan (1994) proposed that time management encompasses individual’s perceptions and attitudes about time: “perceived control of time” and “time attitudes”, respectively. Perceived control of time reflects the extent to which one believes he or she can effect how time is spent and is positively related to time management behaviours (Claessens et al., 2004). Britton and Tesser’s (1991) time attitudes factor is similar to Macan’s construct of received control of time and propose that such attitudes reflect a sense of self-efficacy.

Usunier and Valette-Florence (2007) argue that there are also individual differences concerning motivational aspects of time that is, how individuals cope with time as an external constrained economic resource. Such a motivational aspect of time is “tenacity” (or “persistence”). High tenacity indicates a willingness to undertake projects even if the rewards are only long term, with the opposite pole being the preference for quick return (Tseng and Lin, 2009).

2.3. The relationship between time management and creativity

Managing time is essentially a planning process (Claessens et al., 2004). Almost 60 years ago Guilford (1950) noted that creativity, in its narrowest sense, comprises “the abilities... characteristic of creative people..., which include such activities as inventing, designing, contriving, composing, and planning. People who exhibit these types of behavior to a marked degree are recognized as being creative” (p. 444). Evidence suggests that planning may be a crucial aspect of the creative process (Osburn & Mumford, 2006).

Creativity is a function of available time and is negatively related to time pressure experienced. Amabile et al. (1996) demonstrated that members of work groups that produced low-creativity projects experienced higher time pressure than those who participated in high-creativity projects. In another study, Amabile et al. (2002) found that measures of time pressure collected on a given day, from 177 employees who were members of 22 project teams from 7 organizations, were negatively related to creative cognitive processing on that same day and on subsequent days. Since perceived time pressure seems to be detrimental to creativity, it is plausible that the feeling of having control over one’s time (i.e. perceived control of time) will correlate to creativity measures.

Although, early theory and research has suggested that time management skills may be beneficial for creative outcomes (e.g. Glassman, 1986), up to date no empirical studies attempted to link creativity and time management. Self-regulation and goal-setting theory provides an important conceptual linkage through which creativity and time management can be integrated theoretically. Self regulation theorists (e.g. Bandura, 1997; Carver & Scheier, 1998) suggest that individuals can, to varying degrees, regulate aspects of cognition, motivation and behavior toward the attainment of a goal. According to Zimmerman and
colleagues (Zimmerman, 1995; Zimmerman & Schunk, 2004) self-regulating individuals are in position to set proximal, attainable goals; are learning oriented rather than achievement-oriented; have an understanding that different learning tasks require different strategies and tend to use the most appropriate strategies effectively. Goal-setting theory, assumes that human action is directed by conscious goals and intentions (Locke & Latham, 1990); setting goals is considered an effective motivational technique. The basic motivational assumption of goal setting is that goals increase attention and effort by providing clear targets toward which individuals can direct their energies. In indirect way, goals motivate people to discover and use task strategies that will facilitate goal achievement.

Sternberg (2005) argues that most of the characteristics of creative people largely represent decisions. In other words, to a large extent, people decide to be creative. To be creative, individuals need to be actively engaged in focusing on the task, trying to think of new ways to do things, and trying to combine disparate elements to come up with novel approaches or solutions (Tseng et al, 2011).

Considering that time management may be a particular way of planning, it seems plausible that time management behaviours (i.e. daily planning, long-range planning) can be used as self-regulation strategies toward the attainment of novel or useful ideas. This implies that time management behaviours relate to creativity measures. For example, individuals high in creativity may plan their daily work schedules, so that boring and not intrinsically interesting tasks are completed first; or they could adjust the length of the workday so that at least some work is accomplished during the periods when work is regarded less desirably.

However, as the individual engages in the creative act the intensity of engagement can vary from person to person and from situation to situation (Amabile, 1996; Drazin et al., 1999). An individual may choose minimal engagement, proposing simple solutions that may not be novel; alternatively, an individual may choose to engage in a full manner using all of his/her abilities in an effort to produce novel/useful outcomes. According to Root-Bernstein and Root-Bernstein (2004) an individual can be creative in different domains, for example a scientist can be artistic or an artist can be scientific. They propose that creative abilities are rather domain-general and creative individuals share common intuitive and cognitive tools. An opposing site argues that creativity is domain-specific: people have islands of creativity, not a diffuse tendency to be creative (e.g. Baer, 1998; Feist, 1998). Feist (1998) argued about the temporal stability of the personality dimensions of creative people. This implies that a general measure of the creative personality (such as the CPS) will show lower correlations with time management behaviours compared to a measure that captures the tendency to produce novel and useful ideas.

In addition, in line with approaches arguing that creativity is domain specific, it is plausible that time management as a self-regulatory strategy, is related to creativity under domain-specific conditions. According to Bidjerano and Yun Dai (2007), consciousness (which includes features such as dependability and responsibility, ability to plan, organize and persist in the service of achievement, obedience to rules and conformation to norms) was related to higher tendencies for the use of time management in a sample of US undergraduate students. Within the five -
factor model of personality, time management appears to be most closely related to conscientiousness (Claessens et al., 2004, p. 267). The relation however, between conscientiousness and creativity presents something of a dilemma; conscientiousness seems to contribute to scientific creativity but detract from artistic creativity (Feist, 1998). George and Zhou (2001) found that employees’ high conscientiousness may serve to inhibit creative behavior when the situation encourages the conformist and controlled tendencies of employees who are high on conscientiousness. Other studies have found direct negative associations between conscientiousness and different measures of creativity (especially artistic creativity) (e.g. Batey & Furnham, 2006; Furnham, Zhang, & Chamorro-Premuzic, 2006; Wolfradt & Pretz, 2001).

Finally, while long- or short-ranging planning capture time management behavior, tendency to organize time captures attitude about time. It is reported that creative individuals are intrinsically motivated and are equipped with high levels of persistence (Runco, 2007; Simonton, 2000). Creative individuals may have the tenacity to overcome barriers by deploying time behavioral patterns that maximize effectiveness over the time scale (Macan, 1994). This is in line with the self-regulation perspective, where people cope with their complex and unpredictable environments by developing and managing a set of hierarchically organized goals (Bandura, 1991, 1997). Under the self-regulation perspective, individuals in order to reach their anticipated goals develop plans and strategies and monitor their behaviours in such a way to attain their goals.

2.4. Purpose and scope of the study

Although relationships between creativity and time management behavior and attitudes have not been established, based on the accumulated research, a few meaningful relationships can be explored. Thus, said, we explore the relations between measures of creativity (e.g. a general measure of the creative personality and a product oriented measure focusing on the extent to which outcomes are creative) and time management behaviours and attitudes. We expect higher correlations in the case of the product oriented measure of creativity.

Furthermore, we use the sum of the two creativity measures as a total creativity measure and explore the differences in time management behaviours and attitudes between individuals scoring high and low in creativity. We expect individuals we with high scores on creativity to score higher on both time management behaviour and attitudes.
3. Methods

3.1. Participants and procedure

Survey data were collected from 216 undergraduate students. The majority (59.5%) were engineering students followed by business students (27.7%) and science students (18.8%). Surveys were administrated individually to students, through personal contact by the study authors. Students were randomly located during leisure activities and asked to voluntarily participate in a research project regarding factors influencing entrepreneurship as a career choice. In sum, the sample consisted of 112 male students (50.5%), the mean sample age was 25.2 years (SD= 2.2). The questionnaire contained 40 items representing 9 theoretical constructs along with demographic data (age and gender).

3.2. Measurement of theoretical constructs

3.2.1. Measures of creativity

3.2.1.1. Creative personality. Creative personality was assessed using Gough’s (1979) Creative Personality Scale (CPS). Respondents to the CPS describe themselves by checking off 18 positively scored (capable, clever, confident, egotistical, humorous, individualistic, informal, insightful, intelligent, interests wide, inventive, original, reflective, resourceful, self-confident, sexy, snobbish, and unconventional) and 12 negatively scored items (honest, artificial, well-mannered, cautious, commonplace, narrow interests, conservative, sincere, conventional, dissatisfied, submissive, and suspicious). Positive items were given a value of +1 and negative items a value of −1. The values were then summed to for a CPS index. Scores for the CPS can range from −12 to 18. We followed the procedure described in Oldham and Cummings (1996), to calculate the reliability of the total CPS index and it was found satisfactory (Cronbach’s $\alpha = 0.75$). The CPS is a respected instrument that has been validated in previous studies (e.g. Oldham & Cummings, 1996). A recent research study has confirmed the unidimensionality and internal reliability of the construct (Zampetakis, in press).

3.2.1.2. Self-rating of creativity. Self-rating of creativity was assessed using eight items from the creativity scale developed by Zhou and George (2001). We used this construct to assess individuals’ beliefs in the production of novel and useful ideas. Responses to all 8 items were made on 7-point Likert-type scales (1 = strongly disagree, 7 = strongly agree). Sample items for the production of novel ideas are: “I come up with creative solutions to problems”, “I am a good source of creative ideas”. To derive an overall score, for self-rating creativity for novel ideas all four items were averaged (Cronbach’s $\alpha = 0.80$). Sample items for the production of useful ideas are: “I came up with new and practical ideas to improve
performance”, “I suggest new ways to increase the quality of project assignments. To derive an overall score, for self-rating creativity for useful ideas scores for four items were averaged (Cronbach’s, $\alpha = 0.88$). To derive an overall score, for self-rated creativity, scores for all eight items were averaged (Cronbach’s, $\alpha = 0.90$).

3.2.1.3. Total creativity. Total creativity was assessed by taking the sum of the two creativity measures when z-scored. This allowed the examination of the relationship between a more comprehensive measure of creativity and time management. The two components of the composite (CPS and self-rated creativity) were significantly correlated with each other ($r = 0.26, p < 0.01$); this suggested that they assessed overlapping but distinct aspects of the creativity construct.

3.2.2. Time management behaviour

We adopted 10 items from the Time Management Questionnaire (TMQ) scale developed by Britton and Tesser (1991) and modified by Trueman and Hartley (1996). All items were rated on a 5-point scale: (1) never; (2) infrequently; (3) sometimes; (4) frequently; (5) always. Five items refer to daily planning behaviours and sample items are: “Do you make lists of the things you have to do each day?”, “Do you plan your day before you start it?”, “Do you make a schedule of the activities you have to do on work days?” Scores for all five items were averaged, to derive an overall score (Cronbach’s, $\alpha = 0.82$). Five items refer to confidence on long-range planning, and sample items are: “Do you have a set of goals for the entire quarter?”, “Do you have a set of goals for the entire term?”. Scores for all five items were averaged, to derive an overall score (Cronbach’s, $\alpha = 0.72$). The mean ratings of the 10 items were used as the total time management measure so that the higher the score, the more the participant used time management behaviours. Cronbach’s reliability coefficient 0.87, for all 10 items was deemed acceptable.

3.2.3. Time management attitude and motivational aspects

3.2.3.1. Perceived control of time.

We used four items of scale developed by Claessens et al. (2004). Ratings were made on a 5-point scale ranging from (1) “do not agree at all” to (5) “completely agree”. Items used are: “I feel in control of my time”, “I find it difficult to keep to my schedule because others take me away from my work”, “I feel that I have my work under control”, “I feel confident in that I am able to complete my work on time”. Scores for all four items were averaged, to derive an overall score (Cronbach’s, $\alpha = 0.71$).

3.2.3.2. Tenacity.

We adopted three items from the Time Styles Scale (TSS) scale developed by Usunier and Valette-Florence (2007). Ratings were made on a 7-point scale ranging from (1) “do not
agree at all’ to (7) “completely agree”. Items used are: “Once I have started an activity, I persist at it until I’ve completed”, “When I begin a project, I don’t like to stop it until it is finished”, “When I am interrupted doing a task, I almost always go back to it as soon as I can”. Scores for all three items were averaged, to derive an overall score (Cronbach’s, = 0.76).

3.2.3.3. Preference for disorganization.

We adopted four items from the Time Management Behaviour Scale (TMBS) scale developed by Macan, Shahani, Dipboye, and Philips (1990). All items were rated on a 7-point scale ranging from(1) “do not agree at all’ to (7) “completely agree”. Items used are: “I can find the things I need for my work more easily when my workspace is messy and disorganized than when it is neat and organized”, “I have some of my most creative ideas when I am disorganized”, “I am more effective when I am not prioritizingmy tasks”, “I do not pre plan my tasks”. Scores for all four items were averaged, to derive an overall score (Cronbach’s, = 0.78).

3.3. Assessment of common method variance

In order to avoid problems associated with common method variance often found in cross-sectional survey research, several steps were taken (Podsakoff, MacKenzie, Lee, & Podsakoff, 2003). First, all participants were informed that their participation was completely voluntary and confidential. Second, items referring to the same construct were positioned in different locations throughout the questionnaire. Third, we tested confirmatory factor analysis (CFA) models and followed Anderson and Gerbing’s (1988) procedures to evaluate convergent and discriminate validity (see Appendix A). All analyses were performed using the maximum likelihood estimation method (ML) and the Mplus (version 5.2) software (Muthén and Muthén, 2007). To assess model fit, we employed several statistics (Shook, Ketchen, Hult, & Kacmar, 2004): (a) Root Mean Square Error Approximation (RMSEA): 0 = an exact fit, <0.05 = a close fit, 0.05–0.08 = a fair fit, 0.08–0.10 = a mediocre fit, and >0.10 = a poor fit (Mplus also computes a 90% confidence interval around RMSEA); (b) Comparative Fit Index (CFI): best if above 0.95; (c) Tucker–Lewis Index (TLI): best if above 0.95; (d) Root Mean Square Residual (RMR): best fit for values less than 0.10. For model comparisons, smaller values in Akaike Information Criterion (AIC) represent a better fit of the model (Shook et al., 2004). Results of CFA analyses indicated that all theoretical constructs had an acceptable fit (see Appendix A) and all path coefficients loading to the factor for which it was a proposed were significant at the p < 0.001 level. In summary, results indicate that common method effects are not a likely contaminant of the results observed in this investigation.
4. Results, Discussion, implications

The present study attempts to empirically explore the relationships between creativity and time management behavior and attitudes. Specifically, our results suggested that self-perceived creativity is positively related to daily planning, confidence on long-range planning, total time management, perceived control of time, tenacity, and negatively related to preference for disorganization. In addition, we found moderate to large effect sizes of the mean differences observed on the aforementioned variables between high and low creative individuals. The exploratory and cross-sectional research presented herein, despite limitations, can provide some insights regarding the relation between creativity and the management of time.

Before turning to the broader implications of this study, certain limitations should be noted. To begin, while adequate for the nature of the study, the sample is somewhat homogeneous with the majority (almost 60%) being engineering students. It is not clear that the responses of these participants can be generalized to older employees in organizational settings. Generalizing the results, therefore, from college students should be done with caution. Additionally, it is plausible that results would be quite different with a population of art students.

Furthermore, while the instruments used in this study appear to have been adequate, they provided only self-report data. Future research is needed using experimental methods to measure the relationship between creativity and time management. Furthermore future research could employ other creativity measures such as the Kirton Adaption Innovation Inventory (KAI) (Kirton, 1976) the Torrance Tests of Creative Thinking (Torrance, 1988) or the Consensual Assessment Technique (Amabile, 1982).

Future research should also account for potentially confounding variables in the creativity-time management relationship such as met cognition. Britton and Glynn (1989) refer to met cognition as an executive system overseeing and supervising the operations of cognition. They suggest met cognition is “mental time” that must be managed by creative individuals. Individuals who fail to manage this mental time are not in control of their processing resources, and are thus fated to uncertain outcomes. In contrast, creative individuals who are able to manage their mental time have a much greater likelihood of meeting their creative goals. Finally, it should be recognized that in this study we implicitly used the term "time" as embedded into a social context. This conceptualization of time can vary among individuals, organizations, or societies (Collinson & Cook, 2001). However, a dimension of individual time-related differences that is critical to the understanding of creative endeavors is the notion of “timelessness” (Mainemelis, 2001, 2002). Timelessness is the experience of losing oneself in one’s work such that one seems to transcend time. This is in line with Csikszentmihályi (1990) concept of flow. Flow is a mental state of operation in which the person is fully immersed in what he or she is doing by a feeling of energized focus and full involvement. Focus and concentration hold the key to achieving flow. Many of the peculiarities attributed to creative persons are really just ways to maintain concentration and
lose themselves in the creative process. Future research should examine whether and how “timelessness” and flow are managed.

Even bearing these caveats in mind, we believe that the results obtained in this study have some noteworthy theoretical and practical implications. To begin, time management has not received much attention in studies of creativity. Nonetheless there is reason to suspect that time management may relate to creativity, as people seek to adapt their actions to an envisioned future. And, in fact, the results obtained in this study regarding the relationship between time management behaviours and creativity provides some support for this proposition.

Results showed that individual creativity was significantly related to time management behaviours (daily planning, and confidence on long-range planning) and time attitudes (perceived control of time, tenacity and preference for disorganization). Correlations were found to be stronger when creativity was considered as product oriented (focusing on the extent to which outcomes are useful and novel) compared to correlations obtained with a general creative personality construct (i.e. CPS). This implies that planning daily activities, prioritizing them, and having a confidence on long-range planning are more relevant to the production of novel and useful ideas. In other words our results suggest that time management behaviours may be necessary for the effective exploitation of creative ideas. Furthermore we examined subgroups based on level of creativity in order to investigate potentially systematic changes in terms of time management attitudes and behaviours. Students belonging to the high-creativity group scored higher in all time management and attitudes scales.

These results have some interesting practical implications. First, although individual creativity relates to autonomy (Dewett, 2007; Oldham & Cummings, 1996), it is possible that such autonomy may be meaningless if individuals did not also have the freedom to choose which tasks to plan and schedule. Individuals would need to be able to choose the day-to-day and long-term activities that would lead to the completion of a larger task. This is in line with previous research findings indicating that the most frequently mentioned contextual factor characterizing high-creativity events was freedom (Amabile & Gryskiewicz, 1989). Next, our results implicitly confirm the idea that supervisors’ (teachers) planning skills are an important influence on the work of people high in creativity (Mumford, 2000). Supervisors that are responsible for long-term projects should do substantial planning beforehand and avoid assigning individuals high in creativity, tasks that are not intriguing and motivating.

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