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The Octopus Approach in Time Management: Polychronicity and Creativity

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The current study examined the associations among polychronicity, creativity and perceived time pressure in a military context. Polychronicity refers to an individual's preference for working on many tasks simultaneously as opposed to 1 at a time. As hypothesized, polychronicity was negatively related to creativity. In addition, perceived time pressure moderated this relationship. Specifically, polychronic individuals exhibited less creativity when their perceived time pressure was high. The results underscore that, although today's work environment encourages polychronic approach, it, when reinforced with perceived high time pressure, runs the risk of reducing creativity, which is a critical driver for the survival of organizations.

Keywords: creativity, monochronicity, polychronicity, time pressure

Time is money. Although this saying is a common cliché, it would not be wrong to assert that time is more valuable than money in modern times, because time, as a finite resource for organizations, cannot be saved but can only be spent and once wasted it can never be obtained again. This is especially meaningful for organizations. To increase efficiency and promote high performance, organizations try to manage time properly and deal with time problems systematically. It should be noted that time is increasingly playing a larger role in our understanding of how tasks are performed and its effects on individuals and organizations.

For organizational effectiveness, individuals' time use is as important as organization-level time management practices. In today's work environment, works and tasks are getting more complex in accordance with changes and improvements at work contexts, thus, individuals are increasingly obliged to engage in many tasks at the same time. Employees, quite naturally, differ in how they manage time and in how they achieve their work goals. Whereas some employees might prefer to deal with many tasks simultaneously, others might choose to focus on one task before becoming involved with another. People, indeed, exhibit this preference quite often in their daily lives. The latest technological improvements encourage people to do many things at the same time: talking with cell phone while watching TV, checking social networks while cooking, and so forth.

Furthermore, besides being a preference, work conditions as well, might force individuals to deal with many tasks at the same time. As competitive pressures intensify in rapidly changing environments today, employees are expected to engage in an additional variety of tasks, activities, and roles that they must handle simultaneously (Persing, 1999). Thus, organizations today value employees that can handle multiple tasks at the same time and have begun to select this type of employees in their selection processes. Perhaps, because of this reason, interest in the research of time management in organizations has increased lately.

As organizations are being asked to "do more with less," workers are expected to execute multiple tasks simultaneously at work contexts (Kantrowitz, Grelle, Beaty, & Wolf, 2012). It would be interesting to use an octopus analogy (Clayton, 2010) for such a time orientation. Besides swimming, the octopuses travel along the ocean floor and sometimes on land by walking on their eight arms, each capable of almost independent thought, with the basic controls for voluntary movement embedded within the

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nerve system of the arm itself, which allow them to take on many tasks at once (Clayton, 2010). Similarly, individuals might have many tasks to complete in a given period. Depending on the context, they may not have the chance to postpone the tasks at hand. So, they might need to engage in all tasks, like an octopus, to some extent by prioritizing them.

Human preferences for different patterns of time utilization have potentially important implications for effective workplace behavior (Bluedorn, Kaufman, & Lane, 1992). These preferences are important from both organizational and individual perspective in that it may eventually affect the accomplishment of job goals, and thus performance of both employees and organizations. Like their civilian counterparts, individuals in military organizations are not only frequently faced with unpredictable and ambiguous situations, but also they are expected to work more quickly within limited time periods. Thus, they often have to handle many tasks at the same time or engage in different activities simultaneously. For example, while moving toward the enemy, a tactical level military leader may have to command his unit, use his radio to communicate with upper commands and other units, and check the compass at the same time. In fact, commanders at all levels are expected to take the warfighting functions (e.g., movement and maneuver, intelligence, fires, sustainment, and protection) into account simultaneously to accomplish missions at all phases of a combat. Similarly, an officer working at the headquarters may have to engage in more than one project at the same time. This, indeed, is related to individuals' perception of time and work demands. It is quite natural that people have different perceptions about time and have a preference of how to divide their time, which, at the end, influences their behavior and performance.

Literature Review

Polychronicity

In organizational contexts, one particular construct describing how individuals manage time that has received much attention recently is polychronicity. First studied as a cultural variable (Hall, 1983), *polychronicity* refers to "the extent to which people: prefer to be engaged in two or more tasks or events simultaneously; and believe that their preference is the best way to do things" (Bluedorn, Kalliath, Strube, & Martin, 1999). Thus, people who prefer to complete one task, activity, or project before becoming involved with another are called *monochron*, whereas people who prefer to be involved with several tasks, activities, or projects at once are called *polychron* (Bluedorn et al., 1999). As described previously, it would not be wrong to assert that polychronic people, in fact, use the octopus approach in their time management (i.e., they prefer to use all their arms to accomplish their tasks).

Moreover, it is important to note that not only do monochrons or polychrons have specific preferences for task engagement, but they also believe that their preferred approach is the correct or appropriate way to accomplish things (Bluedorn et al., 1999; Persing, 1999). Thus, polychronicity can be considered a trait in that it is a relatively stable construct over time (Slocombe & Bluedorn, 1999). Similar to other traits, individuals may not be at the extreme, but may be anywhere along the continuum.

Some researchers described specific examples for polychronicity and monochronicity. For example; a polychromic biochemist might prefer running two experiments together while reading a journal article and periodically checking e-mail (Persing, 1999); a polychronic individual might listen to music while jogging (Bluedorn et al., 1999).

Although Edward Hall introduced and described the polychronicity as a cultural variable, König and Waller (2010) suggested that the role of culture as an antecedent of polychronicity may be overestimated. They proposed that work environment requirements and personality may play more direct roles in influencing individuals' levels of polychronicity and ultimately their multitasking behavior. Thus, initially defined as a cultural level construct, polychronicity has received attention as an individual level construct lately, which is also adopted in this study.

Polychronicity has been examined with respect to other variables such as achievement striving, impatience and irritability, general hurry (Conte, Rizzuto, & Steiner, 1999), employee personality (Conte & Jacobs, 2003), role overload (Kaufman, Lane, & Lindquist, 1991),

goal orientation and error orientation (Schell & Conte, 2008), performance ratings (Conte & Jacobs, 2003), job stress (Frei, Racicot, & Travagline, 1999), schedules and deadlines (Benabou, 1999), job satisfaction (Hecht & Allen, 2005), punctuality values (Bluedorn et al., 1999), time awareness (Conte et al., 1999), use of technology (Keating & Murgolo-Poore, 2001), and person-job fit (Hecht & Allen, 2005). However, its relationship with performance, which is the central variable of the organizational studies, is not clear. Some studies show that polychronic orientation is positively related to performance (Conte & Gintoft, 2005; Taylor, Locke, Lee, & Gist, 1984), where other research has not supported this relationship (Conte et al., 1999; Frei et al., 1999). However, there is a common compromise among researchers (Kantrowitz et al., 2012; König and Waller, 2010) that this relationship is contingent on the nature of the job. In explaining this, König and Waller (2010) suggested that polychronicity facilitates job performance only if the environment demands multitasking. They suggested that understanding person–environment fit is key to understanding how polychronicity relates to job performance, because polychronicity can only be expected to relate to job performance when an employee's traits and job demands are well matched. In this vein, Schein (1992) also proposed that monochronic and polychronic orientations each may be better suited to different situational demands. Similarly, Bluedorn (2002) suggested that some jobs require a monochronic orientation (i.e., jobs that require driving), whereas other jobs require a polychromic orientation (i.e., managers, doctors, dentists).

A notable occupation that polychronicity has not been well-researched before is military organizations. The military environment is often characterized by uncertain and unpredictable situations. This places increasingly more demands on military personnel. The complexity and dynamics of the context require individuals to use their time more efficiently. As the differing temporal requirements are likely to dictate the preferred approach in particular jobs (Conte & Gintoft, 2005), it would be interesting to examine polychronicity at military contexts.

Polychronicity, Creativity, and Perceived Time Pressure

Another construct that deserves attention in organizational settings is creativity. *Creativity* is defined as the production of ideas, products, or procedures that are (a) novel and (b) potentially useful or practical (Amabile, 1996). Considerable evidence suggests that employee creativity makes an important contribution to organizational innovation, effectiveness, and survival (Amabile, 1996). The creativity, indeed, has become one of the key drivers of growth, performance, and valuation in organizations today (Montag, Maertz & Baer, 2012). It is self-evident that organizations increasingly need creative ideas in their management practices, products, services and processes to ensure a competitive edge. As a consequence, there has been increasing interest in identifying the contextual conditions that influence such creativity (Shalley, Zhou, & Oldham, 2004). One of these conditions could be time pressure. Time pressure is defined as the difference between the time available and time required for performing a task (Benson & Beach, 1996). Time pressure manifests itself in an organizational context if employees have to work fast to finish assigned tasks, which results in working overtime or being delayed for breaks and leisure-time (Ohly, Sonnentag,& Pluntke, 2006).

Creativity is indispensable not only for civilian but also for military organizations. Vego (2013) underlined that success in a military domain in both peacetime and in war is hardly possible without considerable creativity on the part of the military institutions as whole and the commanders and their staffs at all levels. Thus, it is inherent that military commanders and their staffs must be highly creative in planning, preparing, and employing their forces for combat. Military history is replete with creativity examples. In the First World War, at the Gallipoli Front/Turkey, some units of the British 29th division were planned to land to the Gallipoli peninsula from the *River Clyde*, which was a collier of some 2000 tons. She was planned to surge into the shallows in the early hours of landing, and British troops would stream out of the ship and overwhelm the Turkish defenders (McLachlan, 2010). The creative idea of converting this vessel into a Trojan horse came

from a Royal Naval Officer. Although the attempt resulted in a complete failure due to the heavy fire of the Turkish troops, it can still be considered an innovative idea in military terms.

In the quest to clarify the polychronicity construct, examining its relationship with creativity and time pressure seems a good avenue for research. Because, although the previous research has contributed to explaining the relationship between polychronicity and creativity, the findings are somewhat contradictory. For example, Madjar and Oldham (2006) found that task condition and polychronicity interacted such that individuals who preferred involvement with multiple tasks exhibited higher creativity in the rotation condition, whereas those who preferred involvement with fewer tasks exhibited higher creativity in the sequential condition. However, Kantrowitz et al. (2012) failed to find a relationship between polychronicity and innovativeness/creativity. Given the definitions of the construct, it could be expected that monochrons have sufficient opportunity available to think creatively as they concentrate on one task until completion and allocate relatively much more time to the task at hand. Therefore, it seems logical to assert that monochrons are more prone to produce novel, useful, and practical ideas. By contrast, polychrons carry out multiple tasks at the same time; they shift their attention from one task to another over a relatively short period; they allocate relatively less time to the task at hand; thus they may not have sufficient opportunity to think creatively. In one of the rare studies in military contexts, at a simulated gunner environment, researchers found that performance declined when participants concurrently attempted to monitor, manage, or teleoperate an unmanned ground vehicle (Chen & Joyner, 2009). They concluded that performance suffers when attention is divided among different tasks, as the ability to focus is reduced. With the same logic, we could expect that creativity might also decline as the performance does. Thus, we could expect that polychronicity would be negatively related to creativity.

Furthermore, time pressure could be expected to play a role in this relationship. In view of the literature, although the interaction between time pressure and creativity is well researched albeit inconclusive, the interaction between time pressure and polychronicity on creativity still remains to be explored. Researchers suggest that the experience of high time pressure stifles creativity by reducing the extent to which employees engage in exploratory thinking and by causing them to rely on familiar algorithms when approaching problems (Andrews & Smith, 1996). When individuals perceive high time pressure, they may be less likely to take the time to understand a problem deeply or to fully prepare to solve the problem through contemplation before they delve into response generation (Amabile, Constance, & Steven, 2002). By contrast, those perceiving little pressure should have ample opportunity and energy available to think creatively about issues—to explore different perspectives, to play with ideas, and to see more connections among stimuli (Amabile, 1996). Reviewing the creativity literature, Hennessey and Amabile (2010) concluded that the influence of time pressure may be one of the most complex in the organizational creativity literature and traits may play a role in people's response to time pressure at work. Indeed, polychronicity trait is a good candidate in that manner. Given the definition of the construct, it could be expected that the negative relationship between polychronicity and creativity would be stronger when the polychrons also perceive high time pressure. In other words, individual creativity would be higher when employees with monochronic orientation perceive lower degrees of time pressure. From this point of view, it could be asserted that perceived time pressure of employees can attenuate or enhance the effects of polychronicity on creativity.

Based on the arguments and the literature, the following hypotheses are proposed:

> *H1:* Polychronicity would be negatively related to creativity.
>
> *H2:* Perceived time pressure would moderate the relationship between polychronicity and creativity such that the negative relationship will be stronger when time pressure is high.

As the scholars call for further research that explores the links between polychronicity and different organizational variables in a variety of work settings and industries, the current re-

search further explores the idea that time pressure perceptions moderate the relationship between polychronicity and creativity at a military context.

Method

Participants

Most studies examining polychronicity have been conducted in the United States. The current study used a sample in Turkey, which might increase the validity of the theory. A total of 124 postgraduate students (all males) having a 2-year education at a high-level military academic institution participated in the study. The participants were provided general information about the purpose of the study and confidentiality of the responses were assured. Participation in the study was voluntary. Employment length for the participants ranged from 7 to 14 years (M = 10.5 years, SD = 1.6 years). The participants' age ranged from 29 to 37 years (M = 32.86 years, SD = 1.67 years). Data were collected by self-report questionnaires.

Measures

Previously published and validated measures have been used in this study. All the items were rated on a scale that ranged from 1 (*strongly disagree*) to 5 (*strongly agree*). Polychronicity was measured with 10-item polychronicity scale developed by Bluedorn et al. (1999). Sample items include "I like to juggle several activities at the same time;" "When I work by myself, I usually work on one project at a time" (reverse-scored); and "I believe people should try to do many things at once." The scores were averaged to form a polychronicity score (α = .89). Higher scores indicate a polychronic tendency, whereas lower scores indicate a monochronic one.

Creativity was measured with four items adapted from those developed by Zhou and George (2001). Sample items include "I suggest many creative ideas that might improve working conditions in my organization" and "I often come up with creative solutions to problems at work." The scores were averaged to form a creativity index (α = .82). Higher scores reflect more creativity.

For measuring perceived time pressure, an adapted four-item version of the scale developed by Madjar and Oldham (2006) was used. Sample items include "I have plenty of time to perform my tasks" (reverse-scored) and "I am constantly running out of time in my job." The scores were averaged to form a perceived time pressure index (α = .73).

With regard to control variables, participants' age and tenure were controlled in the analyses.

Turkish language versions of all measures were used after translation and back translation procedures were carried out.

Results

Table 1 provides the descriptive statistics, correlations, and reliabilities for the study variables. A number of significant relationships were observed between the variables, of which the magnitude varied. All the reliabilities exceed the 0.70 standard cited by Nunnally (1978) as being acceptable.

To generate interpretable plots and to remove multicollinearity between the independent variables, I centered the variables tested in the in-

Table 1
Means, Standard Deviations, Correlations, and Cronbach's Alpha for the Study Variables

Variables	*M*	*SD*	1	2	3	4	5
1. Age	32.86	1.7					
2. Tenure	10.47	1.6	.85**				
3. Polychronicity	2.58	.83	−.08	−.01	**(.89)**		
4. Time pressure	2.83	.74	.04	.04	.16	**(.73)**	
5. Creativity	3.22	.72	−.04	−.03	−.19*	−.35**	**(.82)**

Note. Values in parentheses are coefficient alphas.
* $p < .05$. ** $p < .01$.

teraction, as recommended by Aiken and West (1991).

As expected, polychronicity correlated negatively and significantly with creativity ($r = -.22$, $p < .05$). Hence; the Hypothesis 1 was supported. Hypothesis 2, asking for the moderation of perceived time pressure on the relationship between polychronicity and creativity, was tested with moderated hierarchical multiple regressions, using Baron and Kenny's (1986) procedure. To test the hypothesis, creativity was first regressed on control variables (age and tenure; Step 1), then polychronicity and perceived time pressure (Step 2), and finally the interaction of these two variables (polychronicity and perceived time pressure; Step 3). Table 2 shows that after main effects of polychronicity and perceived time pressure were controlled, the moderated interaction term accounted for an additional 1.6% of the variance in creativity, which was significant ($\beta = -.457$, $p < .05$). That percentage is within the typical range of .01–.03 found in nonexperimental studies (Chaplin, 1991; Champoux & Peters, 1987). To probe this interaction, simple slopes were calculated (Aiken & West, 1991). As Figure 1 shows, the direction of the interaction supports the initial prediction. Thus, Hypothesis 2 was also supported.

Discussion

The purpose of this study was to examine the relationship among polychronicity, time pressure, and creativity. As expected, polychronicity, individuals' preference for working on many tasks, has been found to be negatively related to their creativity. Although conducted in a military setting, this study has theoretical and practical implications that may extend to other organizations as well.

In today's work environment, each of these variables is becoming more and more salient in organizational life. As increasing competition, globalization, rapidly changing technology, and knowledge-oriented work promote an organizational culture characterized by speed at both individual and organizational levels (Kantrowitz et al., 2012), individuals have begun to feel more time pressure and tend to prefer to engage in more tasks at the same time. Although such a tendency is encouraged and seems like a good idea at first glance, potential pitfalls deserve further investigation. Thus, the focus of the present study was its effect on creativity, which is a critical driver for the survival of organizations. To the best of our knowledge, this is the first study that examined this relationship with the moderation effect of time pressure at a military context.

In this sense, the findings of the present study indicated that polychronicity is negatively related to creativity, and perceived time pressure proved to play a moderating role in this relationship. That is, the results highlight that, although today's work environment encourages polychronic approach, it—when reinforced with perceived high time pressure—runs the risk of reducing creativity. In terms of explaining this relationship, it should be underlined that individuals showing polychronic orientation move back and forth among tasks and try to engage in multiple tasks at the same time. It is quite normal that they may not have sufficient opportu-

Table 2
Multiple Regression Tests of Moderation

Variable	Creativity		
	Step 1	Step 2	Step 3
Age	−.231	−.272	−.267
Tenure	.193	.233	.252
Polychronicity (Poly)	—	−.213*	−.649*
Perceived time pressure (Ptp)	—	−.314**	−.329**
Poly × Ptp	—	—	−.457*
F	1,011	6,181**	5,448**
R^2	.016	.172	.188
ΔR^2	.016	.156	.016

Note. Standardized beta coefficients are reported.
* $p < .05$. ** $p < .01$.

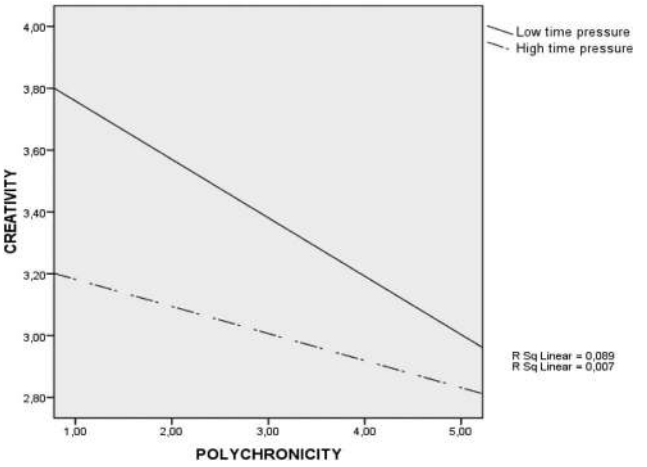

Figure 1. Perceived time pressure as a moderator of the relationship between creativity and polychronicity.

nity and time to focus on the task at hand. So, they are expected to solve problems less creatively. Conversely, monochrons, having more time and opportunity, are expected to produce more creative ideas than polychrons.

Perhaps the most important finding was the influence of time pressure perception on the polychronicity–creativity relationship. The contemporary approach to research on organizational creativity, the interactionist perspective (Woodman, Sawyer, & Griffin, 1993), suggests that an interaction of the subject and situation either facilitates or inhibits a person's creativity (Hsu & Fan, 2010). As one of these situational factors, time has a profound and pervasive influence on creative work and creative achievement (Antes & Mumford, 2009). As creative cognitive processes require time (Amabile, 1983) and concentration, the perception of high time pressure has been thought to prevent or reduce creative thought. However, studies examining the effect of time pressure are inconsistent (see Byron, Khazanchi, & Nazarian's [2010] meta-analysis). Building upon the previously inconsistent results, this study argued and found that time pressure may act as a moderator between time orientation and creativity of individuals in the context of a person—situation interaction. That is, the creativity of individuals' decreases not only with polychronicity tendency but also with perceived high time pressure. In terms of explaining this, it can be argued that individuals under high time pressure may not find the required time for creativity. And furthermore, time pressure might cause stress, resulting in shifts in processing strategies where people use simpler, but less effective, strategies in process execution (De Dreu, 2003). In accordance with these arguments, it can be said that monochrons with lower degrees of time pressure are more prone to producing innovative ideas, because they have more time and opportunity to concentrate to the task at hand, analyze the situation in depth, and so put forward extraordinary solutions to the complex problems. As they do not have time urgency, they have the chance to direct all their cognitive abilities to creative thought instead of managing time. It seems that the creativity of octopuses diminishes when they use all their arms at the same time and when they also have time pressure.

These findings are important from a theoretical perspective in that it is the first study that examines the relationship between the time orientation of military personnel and their creativity with the moderation effect of time pressure. The results contribute to the growing polychronicity and creativity literature by underlining one of the polychronicity's potential negative consequences. Further studies could also examine its relationships with cit-

izenship behaviors, job satisfaction, and so forth under different contextual factors.

There are several potential limitations to the present study. First, all variables were assessed through self-reports, which might create the potential for common method bias. Second, the cross-sectional design of the study does not allow assumptions about the causality of the relationships studied. Thus, a longitudinal design at different times would have been more informative. Future research should focus on generalizing the results across other jobs, organizations, and criteria to determine the associations among the variables. Furthermore, this study was conducted in a military academic context. Further studies could repeat similar studies at headquarters and unit contexts to generalize the results.

Despite these limitations, this study might have some important implications. First, organizations should take steps to reduce time pressure on individuals to foster creativity (e.g., by extending unnecessary deadlines). Second, it is of utmost importance for organizations to know the time use orientation of their employees. In this way, as a necessity of person-job fit, organizations could assign the individuals with monochronic orientation to the positions in which creativity is an essential component. The results have important implications for military organizations as well. These constructs are especially important in a military environment. The efficient time use and creativity of the personnel in finding innovative solutions to complex problems at both peace and war times are crucial in accomplishing the missions, which thus necessitates a thorough examination of them in such contexts. Although time pressure is inevitable in combat situations, and unpredictable and ambiguous nature of the combat force individuals to work more quickly within limited time periods on more tasks, leaders, yet, may take steps to alleviate time pressure so as not to overwhelm subordinates (e.g., by prioritizing the tasks, by dividing the tasks and assigning them to different individuals). Furthermore, consideration of individual characteristics in terms of time orientation may be a useful approach for selecting or assigning suitable military personnel to the positions requiring creative approaches.

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