

## Supervisors' Autonomy Support as a Predictor of Job Performance Trajectories

Yaniv Kanat-Maymon\*

*Interdisciplinary Center (IDC) Herzliya, Israel*

Abira Reizer

*Ariel University, Israel*

Studies have shown that supervisors' autonomy supportive managerial style predicts static job performance and other positive organisational outcomes (Gagné & Deci, 2005). The present study extends these results by investigating the ways in which supervisors' autonomy support affected job performance trajectories over a period of 5 months in a sample of 68 newly employed sport analysts. Multilevel modeling indicated that performance increases in a decelerated fashion over time. Perceived supervisors' autonomy support significantly moderated the linear and quadratic performance trajectories. Thus, over time, the performance growth of employees who perceived their supervisors as supportive of their autonomy was steeper and decelerated at a slower rate. The implications are discussed in the light of autonomy support within Self-Determination Theory (Deci & Ryan, 2000).

### INTRODUCTION

Job performance is defined as volitional actions and behaviors on the part of organisational members that support organisational goals (Murphy, 1989). These behaviors are recognised by formal reward systems and are part of the requirements listed in job descriptions (Williams & Anderson, 1991). Research in the field of industrial/organisational psychology confirms that job performance is a key component of organisational success and has been associated with a company's earnings, productivity, and overall longevity (Johnson, 2003; Motowildo, Borman, & Schmit, 1997). The critical role of job performance for organisational success has led many researchers to explore a variety of

---

\* Address for correspondence: Yaniv Kanat-Maymon, Baruch Ivcher School of Psychology, Interdisciplinary Center (IDC) Herzliya, P.O. Box 167, Herzliya, 46150, Israel. Email: ymaymon@gmail.com

Both authors contributed equally to this manuscript.

antecedents that may affect job performance such as ability (Deadrick, Bennett, & Russell, 1997), motivation (Cerasoli, Nicklin, & Ford, 2014), personality (Thoresen, Bradley, Bliese, & Thoresen, 2004), and managerial/leadership style (Piccolo & Colquitt, 2006).

Nevertheless, several related problems have limited the applicability of research on job performance and its predictors. First, research on job performance has often implicitly assumed that performance is a stable construct that varies little over time. However, longitudinal studies provide evidence for systematic patterns of within-person variability in job performance (e.g. Hofmann, Jacobs, & Baratta, 1993). For instance, a recent meta-analysis by Ng and Feldman (2010) on organisational tenure and job performance indicated that performance initially increases, then plateaus, and if assessed over a long enough period, may eventually decline. Incorrect assumptions about performance stability can result in erroneous conclusions that can be quite costly to organisations. Second, several scholars have suggested that dispositional orientations such as personality, gender, and age may be fundamental determinants of performance trajectories (e.g. Minbashian, Earl, & Bright, 2013; Ng & Feldman, 2010; Thoresen et al., 2004). However, these dispositions are only weakly amenable to manipulation, and thus offer organisations little leverage for effective intervention. Third, performance antecedents may relate to performance differently, depending on how performance is defined. For instance, complex tasks or quality-type tasks tend to require a higher degree of engagement and autonomy, whereas simple tasks are produced primarily by intensely focused, persistent, and structured behavior (Cerasoli et al., 2014). Understanding how these performance trajectories occur and are maintained is especially important since managers need to deal with performance issues before they accumulate.

In the current study we build on concepts and research from Self-Determination Theory (SDT; Deci & Ryan, 2000) to investigate how supervisors' perceived autonomy support relates to employees' job performance trajectories in a sample of junior soccer analysts over a period of 5 months. Although previous reviews have attempted to link autonomy support with job performance, especially in complex tasks (Gagné & Deci, 2005), only a few studies have examined these links empirically (e.g. Baard, Deci, & Ryan 2004). Nevertheless, all of the attempts to link autonomy support to job performance have relied on static indicators of performance. By contrast, the goal of the current research was to test a model that incorporates SDT's unique concept of autonomy support with the natural dynamics of job performance in complex jobs. This model should shed light on the role of supervisors' autonomy support in the growth of performance and in buffering the deterioration that follows. Given the successful attempts to apply autonomy supportive intervention in work organisations (e.g. Hardré & Reeve, 2009) and research indicating the importance of early supervisors' support for junior employees'

work outcomes later on (Kammeyer-Mueller, Wanberg, Rubenstein, & Song, 2013), these findings may be of particular value to managers' and practitioners' socialisation efforts. This study also fills a gap in SDT research since there is a paucity of longitudinal studies exploring the utility of autonomy support to the dynamics of job performance.

## Work Performance Trajectories

Once performance is conceptualised as a trajectory, the pattern of change over time becomes a crucial parameter. Results from several longitudinal studies provide evidence that job performance trajectories are systematic. For instance, long-term studies of the relationship between job tenure and performance have found that performance growth appears to be more dramatic in the early stages and then tapers off with time (e.g. Avolio, Waldman, & McDaniel, 1990; Jacobs, Hofmann, & Kriska, 1990; Schmidt, Hunter, Outerbridge, & Trattner, 1986; Thoresen et al., 2004). In a meta-analysis of 350 empirical studies with a cumulative sample size of 249,841, Ng and Feldman (2010) found that the positive association between tenure and job performance was stronger for subgroups with less tenure and decreased in magnitude for subgroups with more tenure.

A more direct examination of the curvilinear relationship between tenure and performance can be found in longitudinal studies. Hofmann et al. (1993) found a linear trend followed by a plateauing trend of performance over a 3-year period for newly hired insurance sales personnel. In similar vein, Minbashian et al. (2013) investigated newly employed professionals' performance over 4 years. They found that performance trajectories followed linear and quadratic time trends in which performance increases decelerated over time, plateaued at about 3 years, and then started to decline thereafter. Similar trends were portrayed by Ployhart and Hakel (1998) who investigated sales performance over eight consecutive business quarters.

Several theories help to better understand the curvilinear trajectory of job performance. Some researchers have linked different growth patterns to job stages (Kanfer & Ackerman, 1989; Murphy, 1989; Deadrick et al., 1997) based on the conceptual models of job stages put forward by Murphy (1989) and Kanfer and Ackerman (1989). Murphy (1989) presented a two-stage model of job performance dynamics. In the early stage or transition stage employees familiarise themselves with job demands and must learn new skills and make decisions about unfamiliar topics. Similarly, Kanfer and Ackerman (1989) termed the early job stages the declarative stage of skill acquisition, in which employees learn the job and performance is more error-prone. The second job stage of Murphy's model is the maintenance stage. In this stage, all major job tasks are well learned and employees are no longer confronted with situations that present novel or unpredictable demands. Kanfer and Ackerman (1989)

dubbed this the procedural stage where task-related knowledge is automatized and procedures are routinized.

In line with this reasoning, Human Capital Theory (Becker, 1964) as well as learning theory (Weiss, 1990) suggest that with time, workers are better performers because they have accumulated more job-related knowledge and experience (Ehrenberg & Smith, 2000). However, because more learning takes place in the early stages of a job, the increase in job performance is likely to be most pronounced early in an individual's tenure. Later, there simply will be less to learn, and thus additional knowledge or experience will be associated with smaller gains in performance (Avolio et al., 1990; McDaniel, Schmidt, & Hunter, 1988; Struman, 2003).

Attraction Selection Attrition (ASA) theory suggests that employees who achieve high person-organisation (P-O) fit are likely to perform better because they work in organisational environments where their values match those of the company's culture and their skills match the organisation's demands (Kristof-Brown, Zimmerman, & Johnson, 2005). ASA theory suggests that through the process of attrition in particular, employees with low P-O fit will eventually be screened out through a self-selected process of quitting or organisational decisions leading to firing. As a result of attrition of less fit employees, the performance of tenured employees, as a group, increases with time. Moreover, employees with longer tenure are those who survived the early attrition process and thus whose performance tends to stabilise.

A third explanation for the curvilinear trend in performance has to do with motivational processes. In the early stages of a job, interest and intrinsic motivation are high because the tasks are unfamiliar and more innovative. With time, workers learn to perform all their major job tasks and are less likely to confront situations that present novel or unpredictable demands. The decline in excitement and challenge, and the fact the employees might have less room to improve, undermines intrinsic motivation. Given the link between intrinsic motivation and job performance (Gagné & Deci, 2005; Cerasoli et al., 2014), this decline in intrinsic motivation is likely to influence performance trajectories (e.g. Gottfried, Marcoulides, Gottfried, Oliver, & Guerin, 2007).

Thus, this review of job performance trajectories suggests the following:

*Hypothesis 1:* Job performance will increase over time following a positive and linear trend but will also show a deceleration manifested in a negative quadratic trend.

## SDT's Perspective on Motivation and Autonomy Support

Self-Determination Theory (Deci & Ryan, 2000) is grounded in the organismic perspective on human nature and motivation (Ryan, Legate, Niemiec, & Deci,

2012) which assumes that humans are inherently motivated to develop their interests and skills, and to move towards their fullest potential. However, the organismic perspective also asserts that this growth energy is easily derailed if the environment does not support it. Accordingly, SDT posits that interpersonal contexts that support employees' autonomy should facilitate self-determined motivation, which is the underlying mechanism that directs and energises workers' effective functioning. Self-determined motivation (i.e. autonomous motivation) is defined as the sense of choice and volition people experience when they behave in a way that is congruent with their self-endorsed values and interests (Deci & Ryan, 2000).

On the other hand, contexts that hinder employees' autonomy (i.e. controlling contexts) are hypothesised to undermine self-determined motivation. According to SDT, when employees perceive their behavior as being induced by external factors such as incentives, deadlines, and surveillance, they are said to have an external perceived locus of causality (Deci & Ryan, 2000). The construct of locus of causality refers to the personal experience of what initiates and regulates behavior (deCharms, 1968). A perceived external locus of causality involves engagement in an activity because it leads to outcomes that are external to the task itself, such as rewards or recognition. This results in experiencing the activity as controlled and non-volitional (Gagné & Deci, 2005). By contrast, when employees experience an internal locus of causality, they perform an activity because the activity itself is perceived to be interesting or meaningful and they thus come to perceive their actions as self-determined and volitional.

Defined in this way, SDT's notion of autonomy is somewhat different from the typical Hackman and Oldham (1976) and Karasek (1979) concept of autonomy that emphasises task independence and control over decision-making. For instance, task independence characterises the task itself, whereas SDT emphasises the subjective experience of freedom and volition during the activity. Thus although providing task autonomy may lead to feelings of volition, employees might also experience autonomy even though they are not independent. For example, employees might willingly follow strict work safety protocols because they truly understand their rationale and recognise their utility.

According to SDT, events that facilitate an internal perceived locus of causality are considered to be autonomy supportive. One specific and important element in the context of work organisations that has the potential to support autonomy is the general interpersonal orientation of the supervisor. Because in most cases it is the supervisor's responsibility to direct and evaluate subordinates' performance, employees view their supervisor's managerial style as determinant of the extent to which autonomy is supported in the work setting (Gagné & Deci, 2005). More specifically, supervisor's autonomy support refers to the supervisor's ability to understand and acknowledge the subordinates'

perspective, afford choice when possible, provide a meaningful rationale when choice is constrained, encourage self-initiation, and minimise pressure (Deci, Eghrari, Patrick, & Leone 1994; Gagné & Deci, 2005; Moreau & Mageau, 2012).

SDT's concept of autonomy support is distinct from the well-known constructs of perceived organisational support (POS) and perceived supervisor support (PSS). Organisational Support Theory defines POS/PSS as the extent to which employees believe that their organisation or supervisor values their contributions and cares about their well-being (Eisenberger, Stinglhamber, Vandenberghe, Sucharski, & Rhoades, 2002). Rooted in social exchanges, POS/PSS develops to the extent that the organisation meets employees' socio-emotional needs and is willing to reward increased efforts on the part of employees with tangible incentives such as pay and fringe benefits (Eisenberger et al., 2002; Rhoades & Eisenberger, 2002). While tangible rewards are considered by OST to promote organisational support, this practice is considered by SDT to hinder autonomy because it enhances an external locus of causality. Research shows that while autonomy support tends to be negatively or not associated with external perceived locus of causality (Chirkov & Ryan, 2001; Pelletier, Fortier, Vallerand, & Briere, 2001), POS shows positive correlations with non-autonomous motivation (Gagné et al., 2010; Gillet, Gagné, Sauvrière, & Fouquereau, 2013). This suggests that autonomy support and POS/PSS might cover different aspects of support.

With respect to performance, supervisor autonomy support is expected to enhance and maintain employees' performance over time. When supervisors support their employees' autonomy, employees feel that completing their tasks is beneficial to their own self-selected goals because they enjoy the process of working and value the outcome of the activity (Gagné & Deci, 2005). Therefore, autonomy support facilitates the underlying motivational mechanism that directs and energises workers, which should manifest in several desirable work-related outcomes including higher performance.

In line with SDT, cumulative research supports the notion that supervisors' autonomy support can enhance employees' key work outcomes. For instance, supervisors' autonomy supportive style was shown to predict greater work satisfaction (Deci, Connell, & Ryan, 1989), persistence (Vansteenkiste, Simons, Lens, Sheldon, & Deci, 2004; Pelletier et al., 2001), engagement (Deci et al., 2001), internalised motivation (Lynch, Plant, & Ryan, 2005), better acceptance of organisational change (Gagné, Koestner, & Zuckerman, 2000), trust in the organisation (Deci et al., 1989) and lessen intentions to leave (Moreau & Mageau, 2012).

Nevertheless, research has indicated that autonomy support may not be equally effective for all types of tasks. More specifically, it has been proposed that the effectiveness of autonomy support may depend on whether the task is simple or complex (McGraw, 1978). When tasks are mundane and relatively

simple, the path to the solution is straightforward and rote and mostly involves tedious repetition of an algorithm (Amabile, 1982; Grolnick & Ryan, 1987; McGraw & McCullers, 1979). For these tasks, an autonomy supportive context may not have any advantages over a controlling context (e.g. use of incentives, deadlines, and surveillance) in enhancing performance. However, on relatively complex tasks, autonomy support may be especially effective. Complex tasks require creativity, deep processing of information, and information integration. The high engagement and commitment enhanced by an autonomy supportive context are crucial for effective performance on complex tasks.

Several laboratory experiments support this claim (Amabile, Conti, Coon, Lazenby, & Herron, 1996; McGraw & McCullers, 1979). For example, Grolnick and Ryan (1987) found that conceptual learning, which requires deep processing of information, was better under an autonomy supportive condition than a controlling condition. No such difference was found for rote learning. Similarly, Vansteenkiste et al. (2004) found that an autonomy supportive context enhanced self-determined motivation which facilitated test performance and especially conceptual learning.

Concerning work organisation, Baard et al. (2004) conducted a field study among associates in an investment banking firm, a job which presumably involves some complexity and requires decision-making. Their findings indicated that the perception of supervisors as autonomy supporting predicted job performance. Similarly, Kuvaas (2008) found that perceived supervisor autonomy support was linked to perceived performance.

The extent to which an autonomy supportive context enhances engagement and deep learning implies that for complex jobs, employees of an autonomy supportive supervisor may learn the job faster and perform better. Therefore we hypothesised that employees of an autonomy supportive supervisor should show steeper performance trajectories.

*Hypothesis 2:* Perceived supervisor autonomy support will moderate the linear trajectory of performance such that the performance curve should increase more sharply for employees who perceive their supervisor as more autonomy supportive.

Moreover, we also expected that supervisors' autonomy support would buffer the decline in job performance improvement over time. Autonomy support is associated with greater persistence and continuous learning efforts over time (e.g. Pelletier et al., 2001) and this may provide the impetus for workers' continued development and performance on the job which buffers performance decrements (e.g. Baard et al., 2004). In contrast, employees under less autonomy supportive supervisors may find it harder to maintain continuous learning efforts over time, especially as the novelty of the task wears off. Therefore their performance is likely to be more adversely affected throughout their

career. Hence, we hypothesised that the decelerated quadratic trend would plateau less rapidly for workers whose autonomy was supported.

*Hypothesis 3:* Perceived supervisor autonomy support will moderate the quadratic trajectory of performance such that the performance curve should decline at a slower rate for employees who perceive their supervisor as more autonomy supportive.

## METHOD

### Participants and Procedure

The data were collected from a soccer sport analysis company in Israel. Participation was restricted to first year analysts. All the analysts in the company were soccer fans with a vast knowledge of the game's rules and were up to date with soccer teams' performance and personnel. It is important to note that because of the task complexity, the company only employs people with a college education. All the analysts were part-time workers who worked in shifts. According to the company, most analysts quit after two to three years to pursue their careers.

Participants were 68 (out of 78) first year analysts, all males, between the ages of 22 and 35 ( $M = 26.40$ ,  $SD = 2.35$ ). Of these analysts, 54 per cent had a college degree and the rest were undergraduate students. Seniority ranged from 1 to 12 months with a mean of 6.29 months ( $SD = 3.15$ ). To account for its potential effect, seniority was controlled for in all analyses.

The analysts belonged to 8 teams (5 to 10 analysts per team), each of which was led by one supervisor. The employees were asked to participate in the study and were provided with a participant information statement, consent form, and a packet of self-report questionnaires assessing supervisor autonomy support and demographic background. Participants were assured that their responses would remain confidential. In the following 5 months (January to May 2010), the organisational quality control department provided us with each employee's monthly performance score. These performance evaluations are conducted routinely each month and serve as a formal measure of job performance within the organisation. We assumed that collecting performance data for 5 months in addition to the previous tenure (1–12 months) would provide a glimpse into the dynamics of performance over the course of 17 months which corresponds to about 70 per cent of the time that a typical analyst is employed.

### Measures

*Perceived Supervisor's Autonomy Support.* Seven items from the Health Care Climate Questionnaire (HCCQ; Williams, Grow, Freedman, Ryan, & Deci, 1996) were adapted to tap the extent to which employees perceived their supervisor to be autonomy supportive. The items tapped supervisors'



provision of choices, provision of a rationale for their demands and rules, and inquiries about and acknowledgment of others' feelings and perspectives. Sample items are "I feel that my supervisor provides me with choices and options" and "My supervisor listens to how I would like to do things". The responses were expressed on a scale of 1 (strongly disagree) to 7 (strongly agree). Previous research conducted on supervisors and coaches supports the internal reliability and predictive validity of this scale (Moreau & Mageau, 2012; Smith, Ntoumanis, & Duda, 2007). The Cronbach's alpha was .87.

*Job Performance.* The analysts are required to watch live or recorded soccer games and analyze them according to a systematised method. For instance, the analysis concerns tactical parameters such as formation, players' roles, and strategy as well as players' characteristics such as fitness, strengths, and weaknesses. Because this task requires a complex knowledge of the game and involves cognitive effort it qualifies as a complex or quality task (Cerasoli et al., 2014). Each game analysis report is then formally appraised for quality and accuracy by the organisational quality control department, which consists of senior analysts. These appraisals are conducted routinely as part of the formal performance evaluation process. In the appraisal process, a senior analyst compares full reports of 2-4 junior analysts coding the same game and against his own analysis of the strategic parameters. It is important to note that team supervisors are not allowed to appraise their own team members. Therefore, these performance evaluations are conducted independently of the junior analysts and their supervisor. Performance evaluation scores ranged from 1 to 100, with higher values indicating a more accurate report (i.e. fewer errors) and higher quality (i.e. an integrative analysis). Each analyst's monthly report scores were averaged such that the mean score indicated the analyst's monthly performance score. Over the 5 months, 308 monthly performance scores were collected ( $M = 78.09$ ,  $SD = 7.70$ ).

## RESULTS

To determine whether our design had enough power to detect a moderate effect size, we estimated the relative power for the multilevel analysis using the Optimal Design V3.01 computer program (Spybrook et al., 2013). Although the OD was originally developed for power analyses of discrete predictors, Raudenbush and Xiao-Feng (2001) noted that approximations are possible in cases in which explanatory variables are continuous. Post-hoc power in random coefficient models was computed for a sample of 68 participants and five time periods. In the analysis we assumed that the predictors would have main and cross-level interaction effect sizes of .30 (in a correlation metric) which corresponds to a moderate effect size (Cohen, 1992). Estimation of the standard errors assuming  $\alpha = .05$  yielded a power of .81. Assuming a power of .80 to be sufficient (Cohen, Cohen, West, & Aiken, 2003), the probability of rejecting

the null hypothesis in the multilevel design when it was really false was adequate.

The results of the multilevel analyses are presented in three parts. First we decomposed the variance in performance into within-person and between-person levels and calculated the Intraclass Correlation (ICC). Second, we estimated the within-person linear and quadratic trajectories. Third, we introduced supervisors' autonomy support as a between-person moderator of the Level-1 trajectories in addition to its main effect. Because participants had different levels of tenure, we included this as an additional between-person covariate.

Hierarchical linear modeling using HLM 7 was employed to analyze the nested data (Raudenbush & Bryk, 2002). First, we partitioned the variance in job performance into between-teams, between-person, and within-person components. The variance between teams (i.e. Level-3) accounted for less than 1 per cent of the overall variance in performance; therefore, we retained a two-level model in which observations were nested within employees. It is important to note, however, that the three-level model resulted in the same findings as the two-level model. Within-person variability in performance evaluations ( $\sigma^2 = 25.33$ ) accounted for 43 per cent of the overall variance in performance, and between-person variability in performance ( $\tau = 34.06$ ) accounted for the remaining 57 per cent (ICC = .57). This indicates that there was substantial variability in performance over time at both the within- and between-person levels.

Second, we calculated a within-person equation in which variability in performance over time was modeled as a function of linear (i.e. *TIME*) and quadratic (i.e. *TIME\*\*2*) time growth terms. The generic Level-1 and Level-2 equations were:

$$\text{Level 1: } PERFORMANCE_{ij} = \pi_{0j} + \pi_{1j}^*(TIME_{ij}) + \pi_{2j}^*(TIME^{**2}_{ij}) + r_{ij}$$

$$\text{Level 2: } \pi_{0j} = \beta_{00} + u_{0j}$$

$$\pi_{1j} = \beta_{10} + u_{1j}$$

$$\pi_{2j} = \beta_{20} + u_{2j}$$

Time was centered around the third month; thus the random intercept  $\pi_{0j}$  corresponded to performance evaluation of the *i*th employee in the third month of the study. The random slopes  $\pi_{1j}$  and  $\pi_{2j}$ , respectively, refer to the linear and quadratic changes in performance of the *i*th employee due to the passage of one month. The intercept  $\beta_{00}$  represents the average performance in the sample, the intercept  $\beta_{10}$  represents the average linear change in performance for a typical month, and the intercept  $\beta_{20}$  represents the average quadratic change in performance for a typical month.

The results of this analysis are presented in Table 1. The linear growth term,  $\beta_{10}$ , was positive and significant, indicating that performance increased linearly

TABLE 1  
Results of the Hierarchical Linear Modeling Analysis

	<i>B</i>	<i>SE</i>	<i>t</i>	<i>p</i>
<i>Within-person level parameters</i>				
Intercept, $\beta_{00}$	79.05	0.72	109.73	<.001
Linear trajectory, $\beta_{10}$	1.43	0.21	6.79	<.001
Quadratic trajectory, $\beta_{20}$	-0.49	0.13	3.77	<.001
<i>Between-person level parameters</i>				
Autonomy support, $\beta_{01}$	1.97	1.07	1.84	.071
Seniority, $\beta_{02}$	0.47	0.23	2.04	.045
Autonomy $\times$ linear trajectory, $\beta_{11}$	1.39	0.32	2.36	<.001
Autonomy $\times$ quadratic trajectory, $\beta_{20}$	0.50	0.20	2.54	.014
Seniority $\times$ linear trajectory, $\beta_{12}$	-0.16	0.07	2.36	.022
Seniority $\times$ quadratic trajectory, $\beta_{22}$	0.06	0.04	1.57	.120

with time. However, the quadratic growth term,  $\beta_{20}$ , was negative and significant. Together, these findings suggest that performance increased in a decelerated fashion over time.

In addition, we found that the model in which the linear and quadratic slopes were allowed to vary between participants (deviance statistic = 1911.3) had a better fit than a model in which these slopes were fixed (deviance statistic = 1936.2),  $\Delta\chi^2(5) = 24.9, p < .001$ . This suggests that participants varied in the extent to which performance rates initially increased linearly and how quickly these rates decelerated over time.

Third, to examine whether individual differences in performance trajectories could be accounted for by supervisors' autonomy support, we added a between-subject predictor in which the linear and quadratic growth terms were modeled as a function of autonomy support. In addition we included seniority as a covariate to account for its potential statistical effect. The corresponding Level-2 equations were:

$$\begin{aligned} \pi_{0j} &= \beta_{00} + \beta_{01}^*(AUTONOMY SUPPORT_j) + \beta_{02}^*(SENIORITY_j) + u_{0j} \\ \pi_{1j} &= \beta_{10} + \beta_{11}^*(AUTONOMY SUPPORT_j) + \beta_{12}^*(SENIORITY_j) + u_{1j} \\ \pi_{2j} &= \beta_{20} + \beta_{21}^*(AUTONOMY SUPPORT_j) + \beta_{22}^*(SENIORITY_j) + u_{2j} \end{aligned}$$

In these equations,  $\beta_{01}$  and  $\beta_{02}$  represent the main effects of autonomy support and seniority, respectively,  $\beta_{11}$  and  $\beta_{21}$  represent how supervisors' autonomy support moderates the linear and quadratic performance trajectories, respectively, and  $\beta_{12}$  and  $\beta_{22}$  represent how seniority moderates the linear and quadratic performance trajectories, respectively.

As presented in Table 1, autonomy support was positively associated with the linear trajectory and negatively associated with the quadratic trajectory.

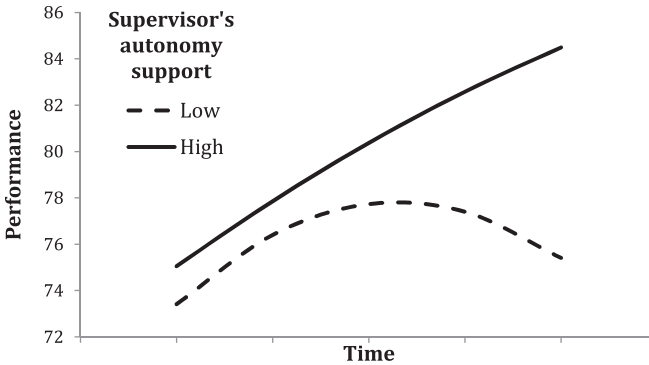


FIGURE 1. Job performance trajectories at different levels of supervisor's autonomy support.

This indicates that when autonomy support was high, the linear trajectory increased more sharply, whereas the quadratic trajectory decelerated more slowly. These trends are presented in Figure 1 which depicts performance trajectories at one *SD* below and above the mean value of the supervisor's autonomy support. It can be seen that the linear acceleration of performance was more pronounced for employees whose supervisors were more autonomy supportive ( $B = 2.36$ ,  $SE = 0.39$ ,  $p < .001$ ) than less supportive supervisors ( $B = 0.50$ ,  $SE = 0.39$ , *ns*). In addition, when supervisor autonomy support was high, the level of deceleration in performance over time was less pronounced ( $B = -0.15$ ,  $SE = 0.33$ , *ns*) in comparison to supervisors who provided less autonomy support ( $B = -0.83$ ,  $SE = 0.33$ ,  $p < .05$ ). Furthermore, the main effect for autonomy support was marginally significant, indicating that supporting autonomy was somewhat associated with average performance.

Finally, with regard to seniority, the main effect of seniority indicated that tenured employees' average performance outweighed that of more recent employees. In addition, seniority was also found to be a significant moderator of the linear trajectory, but not of the quadratic trajectory. Specifically, seniority was negatively associated with the linear growth term, indicating that for more senior employees, performance over time increased less sharply ( $B = 0.92$ ,  $SE = 0.40$ ,  $p < .05$ ) compared to more recent employees ( $B = 1.94$ ,  $SE = 0.39$ ,  $p < .001$ ).

## DISCUSSION

### Theoretical Implications

The purpose of this article was to provide a glimpse into the ways in which supervisors' support, as inspired by SDT (Deci & Ryan, 2000), relates to junior employees' job performance trajectories. A great deal of previous research on

job performance trajectories, as well as findings from the current work, has shown that job performance tends to increase in a decelerated fashion (Minbashian et al., 2013; Ng & Feldman, 2010; Sturman, 2003). Yet, less is known about supervisors' role in shaping these job performance trajectories (Jokisaari & Nurmi, 2009). By synthesising SDT's unique perspective of autonomy with the dynamics of job performance, our work illustrates how supervisors' autonomy support can increase junior employees' performance in the early stages of the job and buffer the decline in performance later on. The findings make four main contributions to the current literature. First, they provide empirical support for SDT's organismic perspective on work organisation which posits that an environmental context that supports autonomy will naturally foster movement toward growth, development, and high quality functioning (Deci & Ryan, 2000). The findings regarding the link between supervisors' autonomy support and increased job performance over time are important because only scant research has examined whether supervisors' autonomy support accounts for job performance (Gagné & Deci, 2005). Moreover, previous investigations of this relationship have focused solely on static job performance and hence were not able to portray how performance develops and is maintained over time (e.g. Baard et al., 2004). Thus the current research fills an important gap in the SDT literature on work organisation.

Second, our findings may have implications for job stages theory (Murphy, 1989). Job stages theory argues that the motivation to learn in the early stages can largely be attributed to the novelty and challenge of the task itself, thus downplaying the importance of supporting motivation in early job stages (Minbashian et al., 2013; Murphy, 1989). However, the current work showed the positive impact on job performance of supervisors' support in early job stages. Our findings are also consistent with recent work by Kammeyer-Mueller et al. (2013) which indicates that early supervisor support is an important predictor of later performance. Together, these works as well as other studies on employees' socialisation (Jokisaari & Nurmi, 2009) highlight the importance of supervisors' support for junior employees.

Third, the findings also contribute to the literature on performance criteria. The analysts who took part in this study are required to have a vast knowledge of the game and their task involves cognitive effort; thus their job qualifies as a complex or quality task (Cerasoli et al., 2014). Gagné and Deci (2005) argued that performance on complex or quality tasks tends to require a higher degree of engagement and greater personal investment. Although engagement was not evaluated, the effect of autonomy support on high quality motivation has been amply documented in a range of domains (Deci & Ryan, 2000) including work organisation (Gagné & Deci, 2005). Therefore, supervisory autonomy support may be a practical way to enhance performance in complex tasks. Further research is required to determine to what extent autonomy support is beneficial to performance in simple tasks over time.

Fourth, the finding regarding the curvilinear trajectory of performance is in line with previous meta-analyses (Ng & Feldman, 2010; Sturman, 2003) and longitudinal studies (e.g. Minbashian et al., 2013) which show that performance increases in early stages, then plateaus, and eventually declines. Moreover, because the present study focused on changes in performance over time, and not on job tenure per se, we did not hypothesise any directional associations between employees' previous tenure and either mean level performance or performance trends. However, we did statistically examine these potential effects. The findings indicated that more tenured employees out-performed less tenured employees and that increases in performance over time were less pronounced for more tenured employees. Overall, these findings are congruent with the tenure-performance curvilinear trajectory (Ng & Feldman, 2010; Sturman, 2003). Tenured employees who are more experienced perform better than less experienced employees. Moreover, because tenured employees perform better, and have a higher starting point, they also have less room to ameliorate with time.

## Practical Implications

The present findings have a number of practical implications for fostering employees' performance. Our findings suggest that supervisor autonomy support may play a key role in moderating performance trajectories, which unlike personality (Thoresen et al., 2004) or demographic characteristics (Ng & Feldman, 2010) is more amenable to intervention (Hardré & Reeve, 2009) and thus can be useful for those charged with training and supervising junior employees. Research should be conducted to identify factors that can prompt supervisors to adopt an autonomy supportive style. For instance, Roth, Assor, Kanat-Maymon, and Kaplan (2007) found that teachers' autonomous motivation in their work predicted the extent to which they were perceived as autonomy supportive. This work suggests that people who find their work interesting and meaningful are naturally more autonomy supportive toward others. Because autonomy to some extent is also a disposition (Weinstein, Przybylski, & Ryan, 2012), assessing dispositional autonomy may be useful for employee selection.

Another promising avenue concerns autonomy supportive interventions. Autonomy support is not a mechanical technique; rather, it is more of an interpersonal style. Therefore, supervisors can be taught how to refine their interpersonal skills and actualise an autonomy supportive style. Research has currently identified four features of autonomy support; namely, providing rationales for requests, nurturing workers' inner motivational resources, acknowledging employees' perspectives including expressions of negative affect, and using non-controlling language. Recent work by Hardré and Reeve (2009), for instance, found that managers who received training on the four autonomy supportive elements displayed more autonomy supportive

behaviors with their employees. From an applied perspective, however, more research is needed to identify other autonomy supportive practices.

## Limitations and Future Research

The limitations of the present study are worth noting. First, our measures were based on subjective assessment. For instance, the degree to which managers were autonomy supportive was provided by the employees. A study in which managers' autonomy support could be assessed in a less subjective manner would be an important addition. Furthermore, performance was subjectively assessed by senior analysts in the organisational quality control department. However, it is important to note that these performance evaluations were based upon a clearly defined set of criteria and were provided by independent analysts. Thus, there is less likelihood that the data were contaminated by issues of common reporter bias or social desirability (Podsakoff, MacKenzie, Lee, & Podsakoff, 2003).

The second limitation has to do with the issue of generalisability. The sample consisted of junior sport analysts. Although this job requires intensive learning in the early stages it may not provide ample opportunities for growth at later stages. Moreover, we tracked performance for 5 months; thus it is not clear to what extent performance stabilises or decreases in the years that follow. In addition, the majority of the analysts view this position as a transitional stage in their careers and quit their jobs after 2 to 3 years. Thus our findings may not generalise to later stages of careers or to occupations which employees perceive as their major career and remain on the job for more than a few years.

Third, we did not assess employees from their first month on the job; thus previous experience on the job may have affected the findings. In order to account for previous experience we controlled for seniority in all the analyses. Future studies should collect data on employees from day one on the job.

In summary, the present study explored SDT's concept of autonomy support, which is an interpersonal style that can be used by managers for all managerial functions. Autonomy support acknowledges employees' feelings and perspectives, provides a meaningful rationale for a request, and maximises subordinates' sense of self-initiation and choice. In manifesting support managers are likely to be better able to understand and communicate the specific directives leading to the desired work outcome. Similar to previous studies on autonomy support, the present study highlights the importance of supervisors' autonomy support for effective performance. Unlike previous studies, however, that have almost exclusively focused on static measures of performance, the present study demonstrates the usefulness of autonomy support to the dynamic process of job performance over time.

## REFERENCES

- Amabile, T.M. (1982). Children's artistic creativity: Detrimental effects of competition in a field setting. *Personality and Social Psychology Bulletin*, 8(3), 573-578.
- Amabile, T.M., Conti, R., Coon, H., Lazenby, J., & Herron, M. (1996). Assessing the work environment for creativity. *Academy of Management Journal*, 39(5), 1154-1184.
- Avolio, B.J., Waldman, D.A., & McDaniel, M.A. (1990). Age and work performance in nonmanagerial jobs: The effects of experience and occupational type. *Academy of Management Journal*, 33(2), 407-422.
- Baard, P.P., Deci, E.L., & Ryan, R.M. (2004). Intrinsic need satisfaction: A motivational basis of performance and well-being in two work settings. *Journal of Applied Social Psychology*, 34(10), 2045-2068.
- Becker, G. (1964). *Human capital: A theoretical and empirical analysis with special reference to education*. New York: Columbia University Press.
- Cerasoli, C.P., Nicklin, J.M., & Ford, M.T. (2014). Intrinsic motivation and extrinsic incentives jointly predict performance: A 40-year meta-analysis. *Psychological Bulletin*, 140(4), 980-1008.
- Chirkov, V.I., & Ryan, R.M. (2001). Parent and teacher autonomy-support in Russian and US adolescents: Common effects on well-being and academic motivation. *Journal of Cross-Cultural Psychology*, 32(5), 618-635.
- Cohen, J. (1992). A power primer. *Psychological Bulletin*, 112(1), 155-159.
- Cohen, J., Cohen, P., West, S.G., & Aiken, L.S. (2003). *Applied multiple correlation regression analysis for the behavioral sciences*. Mahwah, NJ: Lawrence Erlbaum Associates.
- Deadrick, D.L., Bennett, N., & Russell, C.J. (1997). Using hierarchical linear modeling to examine dynamic performance criteria over time. *Journal of Management*, 23(6), 745-757.
- deCharms, R. (1968). *Personal causation: The internal affective determinants of behavior*. New York: Academic Press.
- Deci, E.L., Connell, J.P., & Ryan, R.M. (1989). Self-determination in a work organization. *Journal of Applied Psychology*, 74(4), 580-590.
- Deci, E.L., Eghrari, H., Patrick, B.C., & Leone, D.R. (1994). Facilitating internalization: The self-determination theory perspective. *Journal of Personality*, 62(1), 119-142.
- Deci, E.L., & Ryan, R.M. (2000). The "what" and "why" of goal pursuits: Human needs and the self-determination of behavior. *Psychological Inquiry*, 11(4), 227-268.
- Deci, E.L., Ryan, R.M., Gagné, M., Leone, D.R., Usunov, J., & Kornazheva, B.P. (2001). Need satisfaction, motivation, and well-being in the work organizations of a former Eastern bloc country: A cross-cultural study of self-determination. *Personality and Social Psychology Bulletin*, 27(8), 930-942.
- Ehrenberg, R.G., & Smith, R.S. (2000). *Modern labor economics: Theory and public policy*. Reading, MA: Addison Wesley.
- Eisenberger, R., Stinglhamber, F., Vandenberghe, C., Sucharski, I.L., & Rhoades, L. (2002). Perceived supervisor support: Contributions to perceived organizational support and employee retention. *Journal of Applied Psychology*, 87(3), 565-573.



- Gagné, M.N., & Deci, E.L. (2005). Self-determination theory and work motivation. *Journal of Organizational Behavior, 26*(4), 331–362.
- Gagné, M., Forest, J., Gilbert, M.H., Aubé, C., Morin, E., & Malorni, A. (2010). The Motivation at Work Scale: Validation evidence in two languages. *Educational and Psychological Measurement, 70*(4), 628–646.
- Gagné, M., Koestner, R., & Zuckerman, M. (2000). Facilitating acceptance of organizational change: The importance of self-determination. *Journal of Applied Social Psychology, 30*(9), 1843–1852.
- Gillet, N., Gagné, M., Sauvagère, S., & Fouquereau, E. (2013). The role of supervisor autonomy support, organizational support, and autonomous and controlled motivation in predicting employees' satisfaction and turnover intentions. *European Journal of Work and Organizational Psychology, 22*(4), 450–460.
- Gottfried, A.E., Marcoulides, G.A., Gottfried, A.W., Oliver, P.H., & Guerin, D.W. (2007). Multivariate latent change modeling of developmental decline in academic intrinsic math motivation and achievement: Childhood through adolescence. *International Journal of Behavioral Development, 31*(4), 317–327.
- Grolnick, W.S., & Ryan, R.M. (1987). Autonomy in children's learning: An experimental and individual difference investigation. *Journal of Personality and Social Psychology, 52*(5), 890–898.
- Hackman, J.R., & Oldham, G.R. (1976). Motivation through the design of work: Test of a theory. *Organizational Behavior and Human Performance, 16*(2), 250–279.
- Hardré, P.L., & Reeve, J. (2009). Training corporate managers to adopt a more autonomy-supportive motivating style toward employees: An intervention study. *International Journal of Training and Development, 13*(3), 165–184.
- Hofmann, D.A., Jacobs, R., & Baratta, J.E. (1993). Dynamic criteria and the measurement of change. *Journal of Applied Psychology, 78*(2), 194–204.
- Jacobs, R., Hofmann, D.A., & Kriska, S.D. (1990). Performance and seniority. *Human Performance, 3*(2), 107–121.
- Johnson, J.W. (2003). Toward a better understanding of the relationship between personality and individual job performance. In M. Barrick & A.M. Ryan (Eds.), *Personality and work: Reconsidering the role of personality in organizations* (pp. 83–120). San Francisco, CA: Jossey-Bass.
- Jokisaari, M., & Nurmi, J.E. (2009). Change in newcomers' supervisor support and socialization outcomes after organizational entry. *Academy of Management Journal, 52*(3), 527–544.
- Kammeyer-Mueller, J., Wanberg, C., Rubenstein, A., & Song, Z. (2013). Support, undermining, and newcomer socialization: Fitting in during the first 90 days. *Academy of Management Journal, 56*(4), 1104–1124.
- Kanfer, R., & Ackerman, P.L. (1989). Motivation and cognitive abilities: An integrative/aptitude-treatment interaction approach to skill acquisition. *Journal of Applied Psychology, 74*(4), 657–690.
- Karasek, Jr., R.A. (1979). Job demands, job decision latitude, and mental strain: Implications for job redesign. *Administrative Science Quarterly, 24*(2), 285–308.
- Kristof-Brown, A.L., Zimmerman, R.D., & Johnson, E.C. (2005). Consequences of individuals' fit at work: A meta-analysis of person–job, person–organization, and person–supervisor fit. *Personnel Psychology, 58*, 281–342.

- Kuvaas, B. (2008). A test of hypotheses derived from self-determination theory among public sector employees. *Employee Relations*, 31(1), 39–56.
- Lynch, Jr., M.F., Plant, R.W., & Ryan, R.M. (2005). Psychological needs and threat to safety: Implications for staff and patients in a psychiatric hospital for youth. *Professional Psychology: Research and Practice*, 36(4), 415–425.
- McDaniel, M.A., Schmidt, F.L., & Hunter, J.E. (1988). Job experience correlates of job performance. *Journal of Applied Psychology*, 73, 327–330.
- McGraw, K.O. (1978). The detrimental effects of reward on performance: A literature review and a prediction model. In M.R. Lepper & D. Greene (Eds.), *The hidden costs of reward* (pp. 33–60). Hillsdale, NJ: Erlbaum.
- McGraw, K.O., & McCullers, J.C. (1979). Evidence of a detrimental effect of extrinsic incentives on breaking a mental set. *Journal of Experimental Social Psychology*, 15, 285–294.
- Minbashian, A., Earl, J., & Bright, J.E. (2013). Openness to experience as a predictor of job performance trajectories. *Applied Psychology: An International Review*, 62(1), 1–12.
- Moreau, E., & Mageau, G.A. (2012). The importance of perceived autonomy support for the psychological health and work satisfaction of health professionals: Not only supervisors count, colleagues too! *Motivation and Emotion*, 36(3), 268–286.
- Motowildo, S.J., Borman, W.C., & Schmit, M.J. (1997). A theory of individual differences in task and contextual performance. *Human Performance*, 10(2), 71–83.
- Murphy, K.R. (1989). Dimensions of job performance. In R.F. Dillon & J.W. Pellegrino (Eds.), *Testing: Theoretical and applied perspectives* (pp. 218–247). New York: Praeger.
- Ng, T.W., & Feldman, D.C. (2010). Organizational tenure and job performance. *Journal of Management*, 36(5), 1220–1250.
- Pelletier, L.G., Fortier, M.S., Vallerand, R.J., & Briere, N.M. (2001). Associations among perceived autonomy support, forms of self-regulation, and persistence: A prospective study. *Motivation and Emotion*, 25(4), 279–306.
- Piccolo, R.F., & Colquitt, J.A. (2006). Transformational leadership and job behaviors: The mediating role of core job characteristics. *Academy of Management Journal*, 49(2), 327–340.
- Ployhart, R.E., & Hakel, M.D. (1998). The substantive nature of performance variability: Predicting interindividual differences in intraindividual performance. *Personnel Psychology*, 51(4), 859–901.
- Podsakoff, P.M., MacKenzie, S.B., Lee, J.Y., & Podsakoff, N.P. (2003). Common method biases in behavioral research: A critical review of the literature and recommended remedies. *Journal of Applied Psychology*, 88(5), 879–903.
- Raudenbush, S.W., & Bryk, A.S. (2002). *Hierarchical linear models: Applications and data analysis methods* (Vol. 1). Newbury Park, CA: Sage.
- Raudenbush, S.W., & Xiao-Feng, L. (2001). Effects of study duration, frequency of observation, and sample size on power in studies of group differences in polynomial change. *Psychological Methods*, 6(4), 387–401.
- Rhoades, L., & Eisenberger, R. (2002). Perceived organizational support: A review of the literature. *Journal of Applied Psychology*, 87(4), 698–714.

- Roth, G., Assor, A., Kanat-Maymon, Y., & Kaplan, H. (2007). Autonomous motivation for teaching: How self-determined teaching may lead to self-determined learning. *Journal of Educational Psychology, 99*(4), 761–774.
- Ryan, R.M., Legate, N., Niemiec, C.P., & Deci, E.L. (2012). Beyond illusions and defense: Exploring the possibilities and limits of human autonomy and responsibility through self-determination theory. In M. Mikulincer & P. Shaver (Eds.), *The social psychology of meaning, morality, and choice* (pp. 215–233). Washington, DC: American Psychological Association.
- Schmidt, F.L., Hunter, J.E., Outerbridge, A.N., & Trattner, M.H. (1986). The economic impact of job selection methods on size, productivity, and payroll costs of the federal work force: An empirically based demonstration. *Personnel Psychology, 39*(1), 1–29.
- Smith, A., Ntoumanis, N., & Duda, J.L. (2007). Goal striving, goal attainment, and well-being: Adapting and testing the self-concordance model in sport. *Journal of Sport and Exercise Psychology, 29*(6), 763–782.
- Spybrook, J., Bloom, H., Congdon, R., Hill, C., Liu, X., Martinez, A., & Raudenbush, S.W. (2013). *Optimal design plus empirical evidence* (Version 3.01).
- Sturman, M.C. (2003). Searching for the inverted U-shaped relationship between time and performance: Meta-analyses of the experience/performance, tenure/performance, and age/performance relationships. *Journal of Management, 29*, 609–640.
- Thoresen, C.J., Bradley, J.C., Bliese, P.D., & Thoresen, J.D. (2004). The big five personality traits and individual job performance growth trajectories in maintenance and transitional job stages. *Journal of Applied Psychology, 89*(5), 835–853.
- Vansteenkiste, M., Simons, J., Lens, W., Sheldon, K.M., & Deci, E.L. (2004). Motivating learning, performance, and persistence: The synergistic effects of intrinsic goal contents and autonomy-supportive contexts. *Journal of Personality and Social Psychology, 87*(2), 246–260.
- Weinstein, N., Przybylski, A.K., & Ryan, R.M. (2012). The index of autonomous functioning: Development of a scale of human autonomy. *Journal of Research in Personality, 46*(4), 397–413.
- Weiss, H.M. (1990). Learning theory and industrial and organizational psychology. In M.D. Dunnette & L.M. Hough (Eds.), *Handbook of industrial and organizational psychology* (2nd edn., Vol. 1, pp. 171–221). Palo Alto, CA: Consulting Psychologists Press.
- Williams, G.C., Grow, V.M., Freedman, Z.R., Ryan, R.M., & Deci, E.L. (1996). Motivational predictors of weight loss and weight-loss maintenance. *Journal of Personality and Social Psychology, 70*(1), 115–126.
- Williams, L.J., & Anderson, S.E. (1991). Job satisfaction and organizational commitment as predictors of organizational citizenship and in-role behaviors. *Journal of Management, 17*(3), 601–617.