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and work performance**

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ABSTRACT

The purpose of this study was to explore an alternative relationship between job autonomy and employee outcomes. In contrast to the dominating view that perceived job autonomy leads to increased levels of intrinsic motivation and in turn work performance, we developed a hypothesis proposing that intrinsic motivation moderates the relationship between perceived job autonomy and work performance. Two cross-sectional surveys among 302 employees from different Norwegian service organizations showed that the relationship between perceived job autonomy and both self-reported and line-manager rated work quality was moderated by intrinsic motivation. The form of the moderation revealed a positive relationship only for employees high in intrinsic motivation in both studies. Implications for practice and directions for future research are discussed.

Keywords: perceived job autonomy, intrinsic motivation, work performance

Introduction

Perceived job autonomy is as an essential tenet in contemporary work design theories (Humphrey, Nahrgang, & Morgeson, 2007) and contemporary theories of work motivation (Gagné & Deci, 2005). From originally being regarded as the amount of freedom and independence an individual has in terms of carrying out his or her work assignments (Hackman & Oldham, 1976), contemporary organizational behaviour research has broadened this concept to define job autonomy as the extent to which a job allows freedom, independence, and discretion to schedule work, make decisions, and choose the methods used to perform tasks (Morgeson & Humphrey, 2006). Compelling meta-analytic evidence was recently found for the salient role of perceived job autonomy in being consistently positively related to work performance, job satisfaction, organizational commitment, and intrinsic or internal motivation, and consistently negatively related to absenteeism, stress, and burnout across 259 studies among 219 625 employees (Humphrey, et al., 2007). Job autonomy has also been found to increase employee role breadth (Morgeson, Delaney-Klinger, & Hemingway, 2005) and employee ownership of problems, and enable employees to recognize a wider range of skills and knowledge important for their roles (Parker, 1998).

Increased employee control with respect to work tasks has also been found to increase employee motivation, with respect to increased task mastery and seeking out novel challenges (Morgeson, et al., 2005). In line with such findings, self-determination theory (SDT; Deci & Ryan, 2000; Gagné & Deci, 2005) postulates that the need for autonomy, or being the perceived origin or source of one's own behaviours (Ryan & Deci, 2002, p. 8), is regarded as essential for the emergence or sustainment of intrinsic motivation, or the motivation to perform an activity for itself in order to experience the pleasure and satisfaction inherent in the activity (Deci, Connell, & Ryan, 1989). In their recent review of SDT, Gagné and Deci (2005) convincingly demonstrated the salient role of the need for autonomy in preceding a

range of employee outcomes, including intrinsic motivation and work performance. As such, and in terms of SDT, perceived job autonomy represents a perception of affordances of autonomy through job design that should facilitate the need for autonomy, along with other factors (e.g. autonomy-supportive leadership) (Gagné & Deci, 2005).

Contemporary organizational behaviour motivational models suggest that the relationship between the need for autonomy or perceived job autonomy and work performance is *mediated* by intrinsic motivation (Gagné & Deci, 2005) or critical psychological states such as experienced meaningfulness, experienced responsibility, and knowledge of results (Hackman & Oldham, 1976). In this study, we explore whether intrinsic motivation may *moderate* the relationship between perceived job autonomy and work performance. Our main argument is that, whereas perceived job autonomy provides an opportunity for employees to try out and master new tasks (Morgeson, et al., 2005), the extent to which they actually seize this opportunity depends on their intrinsic motivation. Thus, in order for perceived job autonomy to influence work performance positively, employees may need certain levels of pleasure and satisfaction inherent in their work activities.

While it is widely acknowledged that the job environment affects and is affected by employees' needs, personality, and values, burgeoning research has been conducted on the former and less on the latter, and research is needed on how differences in psychological states may influence the relationship between job characteristics and employee outcomes (Latham & Pinder, 2005). Addressing this gap in the literature, the main contribution of our study is to extend our understanding of the role of perceived autonomy by investigating whether the relationship between perceived job autonomy and work performance is moderated by intrinsic motivation. If a certain level of intrinsic motivation represents a necessary condition for a positive relationship between perceived job autonomy and work

performance, autonomy-supportive work design and work environments may be less universally effective than is usually assumed.

Theory and hypothesis

Work design is concerned with choices made regarding the nature or content of people's jobs, and how these choices affect individual and organizational outcomes such as employee well-being and productivity (Parker & Wall, 2001). Originally, work design focused mainly on job simplification, in terms of breaking down complex tasks to narrower and simpler tasks, in order to ensure that employees behave more dexterously and save time when maintaining similar activities (e.g. Taylor, 1911). Gradually, however, studies emerged demonstrating the psychological costs of job simplification in terms of more dissatisfied, alienated, and less productive employees (Braverman, 1984). These findings directed researchers towards developing theories focusing on the motivating features of work and, among these, the Job Characteristics Model (JCM; Hackman & Oldham, 1976) has survived as a prominent contributor to understanding how employees' perceptions of their work setting may lead to outcomes favourable for themselves, their colleagues, and the organization as a whole (Parker & Wall, 2001). The JCM proposes that five core job characteristics make jobs more satisfying for workers. Among these is job autonomy and, according to the JCM, the core job characteristics facilitate critical psychological states that serve as antecedents for facilitating a range of positive employee states similar to intrinsic motivation (Pierce, Jussila, & Cummings, 2009).

In a related vein, self-determination theory (SDT) posits that the social environment influences intrinsic motivation through its impact on need satisfaction or the perception of autonomy, competence, and relatedness (Grouzet, Vallerand, Thill, & Provencher, 2004). Individuals who are intrinsically motivated work on tasks because they find them enjoyable

and interesting, and find that participation is its own reward (Deci, et al., 1989). According to SDT, the most salient of these needs is the need for autonomy. This need aligns well with earlier theorists (e.g. DeCharms, 1968), particularly the emphasis on experiencing oneself as the locus of causality for one's own behaviours. The need for autonomy is regarded as one of the most fundamental needs (Sheldon, Elliot, Kim, & Kasser, 2001), and a necessity and requirement to be fulfilled in order for intrinsic motivation to emerge or be sustained (Ryan & Deci, 2006). With respect to work settings, a number of studies support the propositions that autonomy-supportive (rather than controlling) work environments promote need satisfaction and intrinsic motivation (see Gagné & Deci, 2005 for a review). In sum, work design and intrinsic motivation theories focus on fulfilment of the basic psychological needs (Gagné & Deci, 2005), or intrinsically motivating work characteristics (Hackman & Oldham, 1976) based on the individual employee's perception of his or her work environment.

An alternative to the widespread assumption that intrinsic motivation mediates the relationship between job autonomy and work performance is that the relationship between perceived job autonomy and work performance is influenced by employees' current levels of intrinsic motivation. Research in educational settings suggests that students high in intrinsic motivation are more persistent, self-driven, and autonomous (Deci & Ryan, 2000). Furthermore, the review by Gagné and Deci (2005) suggests that employees high in intrinsic motivation are more involved in their jobs and demonstrate greater goal attainment than those less intrinsically motivated. These observations suggest that intrinsically motivated employees should respond more actively and positively to perceived job autonomy, as its relationship with work performance is more dependent on employees' self-regulated behaviour and discretionary effort. A larger number of roles and responsibilities may be welcomed by employees with high levels of intrinsic motivation who see more meaning in their work and are more self-driven and autonomous, and therefore result in increased work effort. Also, as

employees high in intrinsic motivation are more persistent and interested in their work, their work quality should increase to higher levels. Employees with low levels of intrinsic motivation, on the other hand, may not have the drive and engagement to work more independently because they lack purpose or meaning in their jobs, have less persistence, and are less self-driven. Therefore, perceived job autonomy may be less positively related to work performance among employees with lower levels of intrinsic motivation:

Hypothesis: Intrinsic motivation moderates the relationships between perceived job autonomy and work performance. The higher the intrinsic motivation, the more positive the relationship.

Methodology

For the present research, we tested the hypothesised relationships in two consecutive, but different, study samples, in line with recent calls by Kline (2004) for an increase in replication studies in organizational behaviour research. The details for each study are presented below.

Study 1

Sample and procedure

Respondents were drawn from a Norwegian subsidiary of a large international software technology company that develops and implements high-tech financial monitoring software solutions for external clients. A questionnaire was distributed to 312 randomly selected employees using a Web-based tool (Confermit), resulting in 199 responses and a response rate of 64 per cent. When responding to the survey, the participants were informed that their responses would be treated confidentially, in order to reduce the presence of response

distortion. Of the respondents, 86 were women and 113 men. Their average tenure was between 3 and 6 years, and 15 per cent of the respondents held manager positions.

Measures

All items were measured on a 5-point Likert response scale ranging from 1 (strongly disagree) to 5 (strongly agree) and had been validated in prior studies. The items used are reported in Appendix A.

Perceived job autonomy was assessed by nine items validated by Morgeson and Humphrey (2006) and used in Norwegian settings by Kuvaas (2009). Intrinsic motivation was assessed by six items previously validated by Dysvik and Kuvaas (2008). Work performance was assessed by ten items that are supposed to capture both how much effort employees put in their jobs and the quality of the output. This scale has previously been validated by Kuvaas and Dysvik (2009).

The respondents were asked to report their gender by way of a dichotomous variable where '1' represented women and '2' men. We asked the respondents to report the number of years employed, representing their tenure, on a 5-item scale, where '1' represented fewer than 3 years and '5' represented more than 15 years. Finally, we asked the respondents to report whether they held managerial responsibilities by a dichotomous variable labelled position, where '1' represented managers and '2' non-managers.

Analyses

The data were analysed in several phases. First, factor analysis (principal component analysis with varimax rotation) was performed on all the multiple-scale items to determine item retention (e.g. Coyle-Shapiro, Kessler, & Purcell, 2004). In order to avoid confounded measures of the closely related constructs, relatively stringent rules of thumb were applied, i.e. retaining only items with a strong loading of .50 or higher (Nunnally & Bernstein, 2007),

a cross-loading of .35 or less (Kiffin-Petersen & Cordery, 2003), and a differential of .20 or higher between factors (Van Dyne, Graham, & Dienesch, 1994).

To test the hypotheses, we used hierarchical moderated regression (Cohen & Cohen, 1983). Interaction terms often create multicollinearity problems because of their correlations with main effects. We thus computed the interaction terms by centring the variables before multiplying them with each other. In the first step, the control variables and perceived job autonomy were regressed on each of the dependent variables. In the second step, intrinsic motivation and the interaction term between perceived job autonomy and intrinsic motivation were included in the equations.

Results

The principal component analysis revealed that one of the items used to measure work effort and one of the items used to measure work quality fell outside our inclusion criteria (see Appendix A for details). The remaining items were combined to form their respective variables through summarizing the mean value for each item. These operations resulted in a 9-item perceived job autonomy scale ($\alpha = .94$), a 6-item intrinsic motivation scale ($\alpha = .88$), a 4-item work effort scale ($\alpha = .78$), and a 4-item work quality scale ($\alpha = .80$).

‘Take in Table 1’

Means, standard deviations, and bivariate correlations for all the variables are reported in Table 1. Pairwise and multiple variable collinearity were inspected by collinearity diagnostics in SPSS prior to the analyses. The lowest tolerance value was .76, which is far above the common cut-off threshold value of .10 (Hair, Anderson, Tatham, & Black, 1998). Of the respondents, 1.5 per cent failed to report their position. These were replaced with the mean value for position prior to the regression analyses.

‘Take in Table 2’

The significant interaction term in the regression analysis revealed that intrinsic motivation moderated the relationship between perceived job autonomy and work quality, but not the relationship between perceived job autonomy and work effort (see Table 2). To probe the form of the significant interaction, we followed the procedure recommended by Aiken and West (1991) and plotted low versus high scores on perceived job autonomy and intrinsic motivation (one standard deviation below and above the means using standardized scores).

‘Take in Figure 1’

The slopes in Figure 1 suggest that the relationship between perceived job autonomy and work quality is more positive for employees high in intrinsic motivation ($\beta = .36, p < .001$) than for employees low in intrinsic motivation ($\beta = .14, p = .06$). A t-test revealed that the two slopes were significantly different from each other ($t = 2.51, p < .01$). Since the data suggest that the quality dimension of work performance, but not the effort dimension, was moderated by intrinsic motivation, we received only partial support for our hypothesis.

Study 2

In the second study, we extended the scope of study from a sole reliance on self-report data to include line manager-rated measures of work effort and work quality. Respondents were drawn from employees in a Norwegian financial organization. A questionnaire was distributed to all 146 employees using a Web-based tool (Confermit). When responding to the survey, the participants were informed that their responses would be treated confidentially, in

order to reduce the presence of response distortion. At the same time, the line managers were asked to assess the work effort and work quality of their employees. Each line manager rated on average 5 employees. These responses were then matched, which resulted in complete dyads from 103 employees and a response rate of 71 per cent. Of the respondents, 50 were women and 53 men. Their average tenure was 10 years. About 80 per cent of them had an undergraduate degree or less, while 20 per cent had a master's degree or higher.

Measures

The measures for perceived job autonomy, intrinsic motivation, and work quality and work performance were the same as those used in the first study, except that work performance items were modified from self-report to line manager-report. The items are reported in detail in Appendices B and C.

The respondents were asked to report their gender by a dichotomous variable where '1' represented women and '2' men. Education level was reported by a 6-level scale, where '1' represented high school diploma or less and '6' represented master's degree or higher. We asked the respondents to report the number of years employed, representing their tenure. Base pay was reported by a 6-level scale, where '1' represented 350 000 Norwegian Kroner (NOK¹) or less and '6' represented 750 000 NOK or more. Level of employment was reported by way of a 4-level scale, where '1' represented baseline worker and '4' represented executive manager.

¹ 350,000 Norwegian Kroner (NOK) equals approximately 43,500 Euro (EUR)

Analyses

The same analytical procedures were employed as in the first study, except for two sets of factor analyses: one on the data reported by the employees and the other on the performance ratings reported by line managers, as these data were derived from an independent source.

Results

The principal component analysis for the data reported by the employees revealed that one of the items used to measure intrinsic motivation fell outside our inclusion criteria (see Appendix B for details). The remaining items were combined to form their respective variables through summarizing the mean value for each item. These operations resulted in a 9-item perceived job autonomy scale ($\alpha = .93$) and a 5-item intrinsic motivation scale ($\alpha = .92$).

The principal component analysis for the data reported by the line managers revealed that one of the items used to measure work quality fell outside our inclusion criteria (see Appendix C for details). The remaining items were combined to form their respective variables through summarizing the mean value for each item. These operations resulted in a 5-item work effort scale ($\alpha = .93$) and a 4-item work quality scale ($\alpha = .86$). Means, standard deviations, and bivariate correlations for all the variables are reported in Table 3.

‘Take in Table 3’

Pairwise and multiple variable collinearity were inspected by collinearity diagnostics in SPSS prior to analyses. The lowest tolerance value was .51, which is far above the common cut-off threshold value of .10 (Hair, et al., 1998).

‘Take in Table 4’

The significant interaction term in the regression analysis revealed that intrinsic motivation moderated the relationship between perceived job autonomy and work quality, but not the relationship between perceived job autonomy and work effort (see Table 4). As shown in Figure 2, plots of low versus high scores on perceived job autonomy and intrinsic motivation revealed a marginally significant positive relationship between perceived job autonomy and work quality for employees high in intrinsic motivation ($\beta = .28$, $p = .08$). No significant relationship was obtained for employees low in intrinsic motivation. A t-test revealed that the two slopes were significantly different from each other ($t = -2.32$, $p < .05$). Accordingly, and as in the first study, we received partial support for our hypothesis.

‘Take in Figure 2’

Discussion

The purpose of this study was to investigate the moderating role of intrinsic motivation on the relationship between perceived job autonomy and work performance. The results from two different work settings, including both self-reported and line manager-rated work performance, suggest that the relationship between perceived job autonomy and work quality is moderated by intrinsic motivation. Across the two studies, we found a positive relationship only for employees high in intrinsic motivation. Employees high in intrinsic motivation seem to cope with the increased responsibility and volition offered or required by the organization by performing better when they have internalized the structure and rules surrounding their roles and obligation at work. In contrast, employees with low levels of intrinsic motivation seem to respond less positively to perceived job autonomy. These employees may lack the drive and engagement needed to work independently *and* well because they may lack purpose and meaning in their jobs, or because they are less self-driven. Accordingly, employees with

lower levels of intrinsic motivation may need higher levels of structure, assistance by supervisors, and external regulation in order to perform well (e.g. Kuvaas, 2006). Taken together, our results suggest that the relationship between job autonomy and work performance may be more complex than suggested by contemporary motivational models, and that there are alternatives to the mediational model of the relationship between job autonomy and employee outcomes (e.g. Humphrey, et al., 2007). Accordingly, an interesting agenda for future research would be to investigate the moderating role of the multiple motivational subdimensions of SDT (intrinsic motivation, integrated, identified, and introjected regulation, external regulation, and amotivation). Employees with high levels of identified regulation and/or integrated regulation would probably respond in similar ways as those who scored high on our measure of intrinsic motivation. In contrast, employees with low levels of identified regulation and/or integrated regulation but with high levels of introjected regulation and/or external regulation should respond in similar ways to those with low levels of intrinsic motivation. It is also possible that the combination of high perceived job autonomy and high levels of external regulation could decrease work performance. Finally, the potential influence of employee motivational profiles on the relationship between job autonomy and work performance could be investigated. Research from the domains of sports and education suggests that motivational profiles, rather than isolated types of motivation, can predict performance (e.g. Chian & Wang, 2008; Gillet, Vallerand, & Rosnet, 2009; Ntoumanis, 2002; Ullrich-French & Cox, 2009).

Contrary to our hypothesis, we received no support for intrinsic motivation as a moderator of the relationship between perceived job autonomy and work effort. First, perceived job autonomy may create effort through perceived responsibility independently of intrinsic motivation. Second, if perceived job autonomy implies that employees feel trusted, they may become pro-socially motivated and reciprocate by expending increased effort in performing

their jobs (Batson, 1987). As such, perceived responsibility and prosocial motivation may in part explain why the relationship between perceived job autonomy and work effort is not significantly influenced by intrinsic motivation. This explanation corresponds with research from the domain of sports, which suggests that identified regulation associated with meaning and purpose is the key ingredient for persistence and effort on various tasks (e.g. Thøgersen-Ntoumani & Ntoumanis, 2006).

It should also be noted that our data are also indicative of the classical mediated model. The direct relationships between perceived job autonomy and both work effort and work quality in the first study were markedly reduced after the inclusion of intrinsic motivation in the regression model. Sobel tests (Preacher & Leonardelli, 2001) revealed that these drops were significant for both work effort ($z = 2.89, p < .01$) and work quality ($z = 2.36, p < .05$) and supportive of partial mediation. In the second study, perceived job autonomy was not significantly related to the work performance measures. Still, the significant drops in standardized betas after the inclusion of intrinsic motivation suggest an indirect relationship (Mathieu & Taylor, 2006). That is, perceived job autonomy increases intrinsic motivation, which in turn enhances work effort and work quality. Accordingly, the classical mediated model is certainly valid, but with respect to work quality, the moderated model adds exploratory power on this relationship.

Limitations

Our studies have several limitations. First, since we chose to include line manager-rated work performance in the second study, the total sample size became small. Consequently, while the b-value for the interaction in study 2 was substantial ($\beta = .28$), the p-value was only marginally significant ($p = .08$). Future studies should therefore include larger sample sizes in order to substantiate further our novel findings. Still, it should be noted that a small sample

provides a more conservative test (Song, Tsui, & Law, 2009), and the true relationships between the variables in our study may therefore be stronger than unveiled (Aguinis & Harden, 2009; Kline, 2004). Finally, the fact that the same pattern of results was obtained from two different samples where we used different data sources (self-reported and line manager-rated measures of work performance), should strengthen the validity of the findings (Podsakoff, MacKenzie, Lee, & Podsakoff, 2003; Spector, 2006).

As the data for both studies were gathered at one point in time, it is impossible to draw inferences of causality or rule out the possibility of reverse causality. For instance, it is possible that well performing employees are allowed more discretion and therefore will perceive higher levels of job autonomy. Consequently, longitudinal or experimental studies are needed in order to approach causality inferences more closely on the relationships examined in the present study. Beyond conducting similar studies with longitudinal designs, an interesting avenue for future research would be to investigate alternative moderators on the relationship between perceived job autonomy and work performance. Recent studies suggest that individual attitudes such as organizational commitment could play a key role (Gagné, Chemolli, Forest, & Kostner, 2008). Furthermore, organizational commitment, perceived organizational support and justice perceptions have been found to moderate the relationship between perceptions of supportive HR-practices and employee outcomes (Kuvaas, 2008). In addition, future research could extend the scope and include outcome variables beyond in-role performance such as citizenship behaviours (e.g. Organ, 1988) and counterproductive or deviant behaviors (e.g. Bennett & Robinson, 2000).

Finally, it should be noted that our measure of intrinsic motivation differs from what is usually applied in SDT research. From an SDT point of view, meaning would probably reflect identified regulation. Still, what is meaningful to a person depends on personal values, which may vary from person to person (from being of importance to others' well being, having fun,

learning and developing oneself etc.). Accordingly, having the experience of a meaningful job should certainly represent a motivation to perform an activity for itself that can be experienced as both satisfactorily and pleasurable. With this background, we have used a measure that we think taps the core of the widely used construct definition (i.e. the motivation to perform an activity for itself, in order to experience the pleasure and satisfaction inherent in the activity (Deci, et al., 1989). Furthermore, a recent study by Tremblay, Blanchard, Taylor, & Pelletier (2009) found the six motivational subdimensions of SDT to be adequately represented by two higher-order factors; Work self-determined and non-self-determined motivation. In this respect, our measure should be comparable with work self-determined motivation (consisting of intrinsic motivation, integrated regulation, and identified regulation).

Implications for practice

If the associations between perception of job autonomy, intrinsic motivation, and the dependent variables represent causal relationships, our results may have important implications for managers in taking individual and contextual considerations into account when designing jobs. Perhaps the most important implication is that a “one size fits all” perspective may attenuate individual employee outcomes in terms of the provision of autonomy-supportive work design or work environments. If the relationship between job autonomy and work performance is dependent on employees’ levels of intrinsic motivation, attention at the individual level seems warranted. First, in terms of recruitment practices, focus should be directed at obtaining employees with the potential of finding interest, meaning and enjoyment with their work (Pfeffer, 1998). Second, in terms of structure and supervision, employees low in intrinsic motivation may need higher levels of structure, assistance by supervisors, and external regulation in order to perform well.

Table 1*Descriptive Statistics, Correlations, and Scale Reliabilities for Study 1*

Variable	Mean	SD	1	2	3	4	5	6	7	
1. Gender	1.57	0.50	-							
2. Tenure	2.43	1.23	.06	-						
3. Position	1.85	0.36	.03	-.29***	-					
4. Perceived job autonomy	4.17	0.66	.18*	.28***	-.14*	-	(.94)			
5. Intrinsic motivation	3.77	0.69	.03	.06	-.17*	.39***	-	(.88)		
6. Work effort	4.19	0.55	-.13	.07	-.15*	.28***	.32***	-	(.78)	
7. Work quality	3.82	0.54	-.05	.18*	.05	.36***	.27***	.48***	-	(.80)

Note. Coefficient alphas are displayed on the diagonal. Position: 2 = *non-manager*, 1 = *manager*. *p < .05; **p < .01; ***p < .001.

Table 2*Results of Regression Analyses for Study 1*

	Step 1	Step 2	Step 3	Step 4	Step 1	Step 2	Step 3	Step 4
	Work effort	Work effort	Work effort	Work effort	Work quality	Work quality	Work quality	Work quality
Gender	-.12	-.17*	-.16*	-.16*	-.04	-.09	-.09	-.09
Tenure	.05	-.02	.00	.00	.20**	.12	.13	.13
Position	-.12	-.10	-.07	-.07	.10	.13	.15*	.14*
Perceived job autonomy		.30***	.20**	.20**		.32***	.25**	.25**
Intrinsic motivation			.24**	.25***			.19*	.22**
Perceived job autonomy × Intrinsic motivation				.03				.16*
Adjusted R ²	.021	.097	.142	.138	.022	.111	.136	.157
ΔR ²	.036	.079	.048	.001	.037	.091	.029	.024
F	2.408	6.298***	7.539***	6.284***	2.504	7.155***	7.233***	7.124***
ΔF	2.408	17.363***	11.180**	.171	2.504	20.362***	6.705*	5.698*

Standardized regression coefficients are shown; *p < .05; **p < .01; ***p < .001

Table 3*Descriptive Statistics, Correlations, and Scale Reliabilities for Study 2*

Variable	Mean	SD	1	2	3	4	5	6	7	8	9	
1. Gender	1.51	0.50	-									
2. Education	4.55	1.17	.35***	-								
3. Tenure	9.27	8.37	-.02	-.34***	-							
4. Base pay	3.14	1.75	.51***	.44***	.00	-						
5. Level	1.42	0.81	.28**	.14	.11	.52***	-					
6. Perceived job autonomy	3.79	0.59	.32***	.16	-.02	.40***	.34***	-	(.93)			
7. Intrinsic motivation	3.53	0.82	.12	-.05	.10	.36***	.27**	.53***	-	(.92)		
8. Work effort	3.79	0.77	-.11	.03	-.07	.11	.16	.18	.34***	-	(.93)	
9. Work quality	3.63	0.69	-.12	.03	.11	-.05	.22*	.17	.25*	.61***	-	(.86)

Note. Coefficient alphas are displayed on the diagonal; *p < .05; **p < .01; ***p < .001

Table 4*Results of Regression Analyses for Study 2*

	Step 1	Step 2	Step 3	Step 4	Step 1	Step 2	Step 3	Step 4
	Work effort	Work effort	Work effort	Work effort	Work quality	Work quality	Work quality	Work quality
Gender	-.19	-.22	-.18	-.17	-.15	-.18	-.15	-.12
Education	-.02	-.01	.07	.07	.17	.19	.26	.25*
Tenure	-.11	-.10	-.12	-.11	.12	.14	.12	.12
Base pay	.15	.10	-.02	-.03	-.18	-.24	-.34*	-.36**
Level	.16	.13	.15	.14	.28*	.24*	.26*	.25*
Perceived job autonomy		.17	-.02	.00		.21	.05	.10
Intrinsic motivation			.36**	.38**			.30*	.33**
Perceived job autonomy × Intrinsic motivation				.11				.23*
Adjusted R ²	.021	.035	.110	.113	.058	.085	.136	.180

ΔR^2	.069	.023	.080	.011	.104	.035	.056	.050
F	1.431	1.608	2.803*	2.621*	2.251	2.586*	3.284**	3.801**
ΔF	1.431	2.390	9.156**	1.283	2.251	3.921	6.574*	6.170*

Standardized regression coefficients are shown; * $p < .05$; ** $p < .01$; *** $p < .001$

Appendix A

Principal Component Analysis with Varimax Rotation for Study 1

Items	AUT	IM	WQ	WE
AUT9: The job allows me to decide on my own how to go about doing my work	<u>.85</u>			
AUT3: The job allows me to plan how I do my work	<u>.83</u>			
AUT8: The job gives me considerable opportunity for independence and freedom in how I do the work	<u>.82</u>			
AUT1: The job allows me to make my own decisions about how to schedule my work	<u>.81</u>			
AUT5: The job allows me to make a lot of decisions on my own	<u>.79</u>			
AUT4: The job gives me a chance to use my personal initiative or judgement in carrying out the work	<u>.79</u>			
AUT6: The job provides me with significant autonomy in making decisions	<u>.78</u>			
AUT2: The job allows me to decide on the order in which things are done on the job	<u>.76</u>			
AUT7: The job allows me to make decisions about what methods I use to complete my work	<u>.71</u>			
IM5: My job is so interesting that it is a motivation in itself		<u>.88</u>		
IM4: The tasks that I do at work are themselves representing a driving power in my job		<u>.85</u>		
IM2: The tasks that I do at work are enjoyable		<u>.79</u>		
IM1: My job is very exciting		<u>.76</u>		
IM6: Sometimes I become so inspired by my job that I almost forget everything else around me		<u>.70</u>	.30	
IM3: My job is meaningful		<u>.65</u>		
WQ2: The quality of my work is top-notch			<u>.84</u>	
WQ5: Others in my organization look at my work as typical high-quality work			<u>.78</u>	
WQ1: The quality of my work is usually high			<u>.68</u>	
WQ3: I deliver higher quality than can be expected			.66	.51

WQ4: I rarely complete a task before I know that the quality meets high standards	<u>.58</u>	.34			
WE5: I usually don't hesitate to put in extra effort when it is needed	<u>.77</u>				
WE3: I often expend extra effort in carrying out my job	<u>.74</u>				
WE4: I often expend more effort when things are busy at work	.35	<u>.71</u>			
WE1: I try to work as hard as possible		.78			
WE2: I intentionally expend a great deal of effort in carrying out my job	<u>.50</u>	.56			
Eigenvalues	8.31	3.41	2.71	1.38	1.01
% of variance	33.28	13.65	10.86	5.54	4.07

Factor loadings less than .30 are not shown; **bold and underlined loadings included in the final scales;**

AUT = perceived job autonomy; IM = intrinsic motivation; WQ = work quality; WE = work effort.

Appendix B

Principal Component Analysis with Varimax Rotation for Study 2

Items	AUT	IM
AUT1: The job allows me to make my own decisions about how to schedule my work	<u>.82</u>	
AUT5: The job allows me to make a lot of decisions on my own	<u>.79</u>	
AUT2: The job allows me to decide on the order in which things are done on the job	<u>.78</u>	
AUT3: The job allows me to plan how I do my work	<u>.77</u>	
AUT9: The job allows me to decide on my own how to go about doing my work	<u>.77</u>	.35
AUT7: The job allows me to make decisions about what methods I use to complete my work	<u>.75</u>	.31
AUT6: The job provides me with significant autonomy in making decisions	<u>.74</u>	
AUT8: The job gives me considerable opportunity for independence and freedom in how I do the work	<u>.71</u>	.30
AUT4: The job gives me a chance to use my personal initiative or judgement in carrying out the work	<u>.70</u>	.35
IM4: The tasks that I do at work are themselves representing a driving power in my job		<u>.88</u>
IM5: My job is so interesting that it is a motivation in itself		<u>.87</u>
IM3: My job is meaningful		<u>.86</u>
IM2: The tasks that I do at work are enjoyable		<u>.80</u>
IM6: Sometimes I become so inspired by my job that I almost forget everything else around me		<u>.80</u>
IM1: My job is very exciting	.37	.72
Eigenvalues	7.95	2.28
% of variance	53.03	15.22

Factor loadings less than .30 are not shown; **bold and underlined loadings included in the final scales**; AUT = perceived job autonomy; IM = intrinsic motivation.

Appendix C

Principal Component Analysis with Varimax Rotation for Study 2

Items	WE	WQ
WE4: He/she often expends more effort when things are busy at work	<u>.89</u>	
WE5: He/she usually doesn't hesitate to put in extra effort when it is needed	<u>.84</u>	.35
WE1: He/she tries to work as hard as possible	<u>.84</u>	
WE2: He/she intentionally expends a great deal of effort in carrying out his/her job	<u>.82</u>	
WE3: He/she often expends extra effort in carrying out his/her job	<u>.81</u>	.31
WQ4: He/she rarely completes a task before he/she knows that the quality meets high standards		<u>.85</u>
WQ2: The quality of his/her work is top-notch		<u>.84</u>
WQ5: Others in my organization look at his/her work as typical high-quality work	.35	<u>.75</u>
WQ1: The quality of his/her work is usually high	.43	.75
WQ3: He/she delivers higher quality than can be expected	.31	<u>.72</u>
Eigenvalues	6.13	1.37
% of variance	61.33	13.74

Factor loadings less than .30 are not shown; **bold and underlined loadings included in the final scales**; WE = work effort; WQ = work quality.

Figure 1

*The Moderating Role of Intrinsic Motivation on the Relationship between
Perceived Job Autonomy and Work Quality in Study 1*

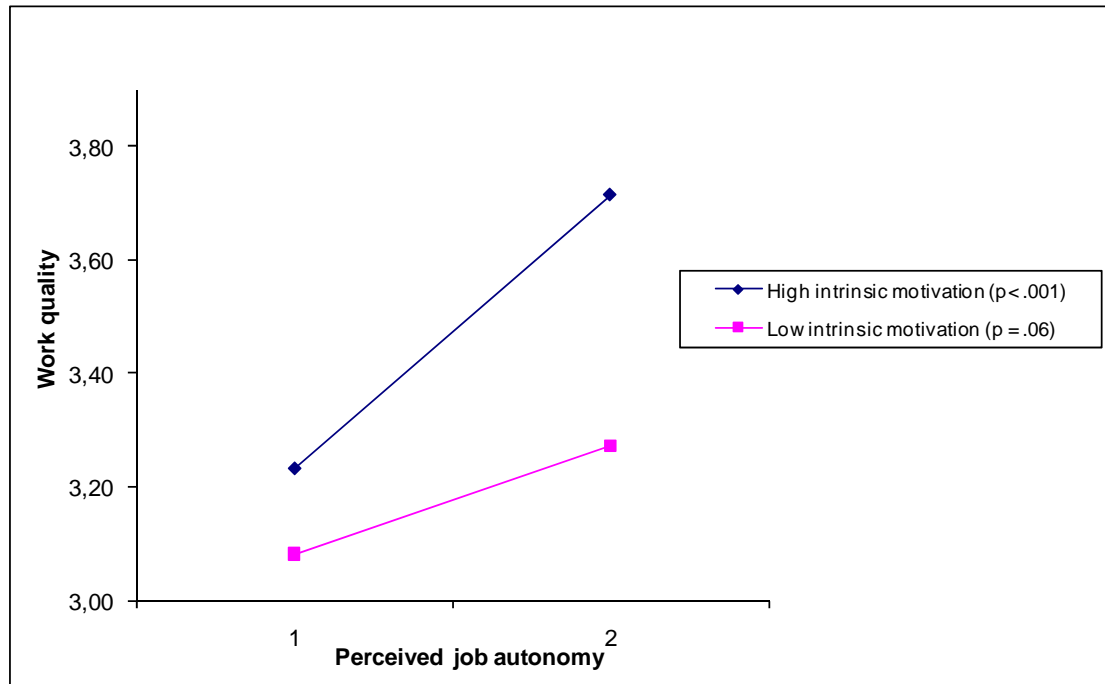
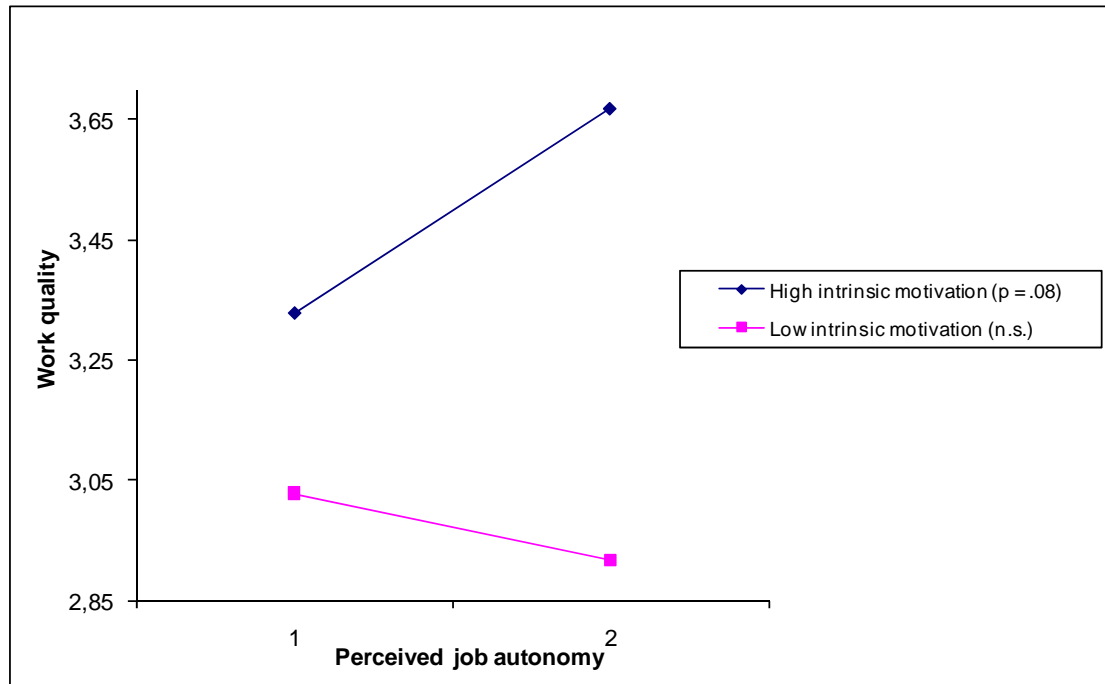


Figure 2

*The Moderating Role of Intrinsic Motivation on the Relationship between
Perceived Job Autonomy and Work Quality in Study 2*



References

- Aguinis, H., & Harden, E. E. (2009). Sample size rules of thumb. In C. E. Lance & R. J. Vandenberg (Eds.), *Statistical and methodological myths and urban legends* (pp. 267-286). London: Routledge.
- Aiken, L. S., & West, S. G. (1991). *Multiple regression: Testing and interpreting interactions*. Thousand Oaks, CA: Sage.
- Batson, C. D. (1987). Prosocial motivation: Is it ever truly altruistic? In L. Berkowitz (Ed.), *Advances in Experimental Social Psychology* (Vol. 20, pp. 65-122). New York: Academic Press.
- Bennett, R. J., & Robinson, S. L. (2000). Development of a Measure of Workplace Deviance. *Journal of Applied Psychology, 85*, 349-360
- Braverman, H. (1984). The Real Meaning of Taylorism. In F. Fisher & C. Sirianni (Eds.), *Critical studies in Organization and Bureaucracy* (pp. 79-86). Philadelphia: Temple Press.
- Chian, L. K. Z., & Wang, C. K. J. (2008). Motivational Profiles of Junior College Athletes: A Cluster Analysis. *Journal of Applied Sport Psychology, 20*, 137-156
- Cohen, J., & Cohen, P. (1983). *Applied multiple regression/correlation analysis for the behavioral sciences* (2nd. ed.). Hillsdale, NJ: Lawrence Erlbaum.
- Coyle-Shapiro, J. A.-M., Kessler, I., & Purcell, J. (2004). Exploring organizationally directed citizenship behaviour: Reciprocity or "It's my job"? *Journal of Management Studies, 41*, 85-106
- 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*, 580-590
- 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*, 227-268
- Dysvik, A., & Kuvaas, B. (2008). The relationship between perceived training opportunities, work motivation and employee outcomes. *International Journal of Training and Development, 12*, 138-157
- Gagné, M., Chemolli, E., Forest, J., & Kostner, R. (2008). A temporal analysis of the relation between organisational commitment and work motivation. *Psychologica Belgica, 48*, 219-241
- Gagné, M., & Deci, E. L. (2005). Self-determination theory and work motivation. *Journal of Organizational Behavior, 26*, 331-362
- Gillet, N., Vallerand, R. J., & Rosnet, E. (2009). Motivational clusters and performance in a real-life setting. *Motivation and Emotion, 33*, 49-62
- Grouzet, F. M. E., Vallerand, R. J., Thill, E. E., & Provencher, P. J. (2004). From environmental factors to outcomes: A test of an integrated motivational sequence. *Motivation and Emotion, 28*, 331-346
- Hackman, J. R., & Oldham, G. R. (1976). Motivation through the design of work: Test of a theory. *Organizational Behavior and Human Performance, 16*, 250-279
- Hair, J. F. J., Anderson, R. E., Tatham, R. L., & Black, W. C. (1998). *Multivariate data analysis* (5th ed.). New York: Maxwell Macmillan International.
- Humphrey, S. E., Nahrgang, J. D., & Morgeson, F. P. (2007). Integrating motivational, social and contextual work design features: A meta-analytic

- summary and theoretical extension of the work design literature. *Journal of Applied Psychology*, 92, 1332-1356
- Kiffin-Petersen, S., & Cordery, J. L. (2003). Trust, individualism and job characteristics as predictors of employee preference for teamwork. *International Journal Human Resource Management*, 14, 93-116
- Kline, R. B. (2004). *Beyond significance testing - reforming data analysis methods in behavioral research*. Washington D.C.: American Psychological Association.
- Kuvaas, B. (2006). Performance appraisal satisfaction and employee outcomes: Mediating and moderating roles of motivation. *The International Journal of Human Resource Management*, 17, 504-522
- Kuvaas, B. (2008). An exploration of how the employee-organization relationship affects the linkage between perception of developmental human resource practices and employee outcomes. *Journal of Management Studies*, 45, 1-25
- Kuvaas, B. (2009). A test of hypotheses derived from self-determination theory among public sector employees. *Employee Relations*, 31
- Kuvaas, B., & Dysvik, A. (2009). Perceived investment in employee development, intrinsic motivation and work performance. *Human Resource Management Journal*, 19, 217-236
- Latham, G. P., & Pinder, C. C. (2005). Work motivation theory and research at the dawn of the twenty-first century. *Annual Review of Psychology*, 56, 485-516
- Mathieu, J. E., & Taylor, S. R. (2006). Clarifying conditions and decision points for mediational type inferences in Organizational Behavior. *Journal of Organizational Behavior*, 27, 1031-1056

- Morgeson, F. P., Delaney-Klinger, K., & Hemingway, M. A. (2005). The importance of job autonomy, cognitive ability, and job-related skill for predicting role breadth and job performance. *Journal of Applied Psychology, 90*, 399-406
- Morgeson, F. P., & Humphrey, S. E. (2006). The work design questionnaire (WDQ): Developing and validating a comprehensive measure for assessing job design and the nature of work. *Journal of Applied Psychology, 91*, 1321-1339
- Ntoumanis, N. (2002). Motivational clusters in a sample of british physical education classes. *Psychology of Sport and Exercise, 3*, 177-194
- Nunnally, J. C., & Bernstein, I. H. (2007). *Psychometric theory* (3rd ed.). New York, NY: McGraw-Hill.
- Organ, D. W. (1988). *Organizational citizenship behavior: The good soldier syndrome*. Lexington, MA.: Lexington Books.
- Parker, S. K. (1998). Enhancing role breadth self-efficacy: The roles of job enrichment and other organizational interventions. *Journal of Applied Psychology, 83*, 835-852
- Parker, S. K., & Wall, T. D. (2001). Work Design: Learning from the Past and Mapping a New Terrain. In N. Anderson, D. S. Ones, H. K. Sinangil & C. Viswesvaran (Eds.), *Handbook of Industrial, Work & Organizational Psychology* (Vol. 1 - Personnel Psychology, pp. 90-109). London: Sage.
- Pfeffer, J. (1998). Seven practices of successful organizations. *California Management Review, 40*, 96-124
- Pierce, J. L., Jussila, I., & Cummings, A. (2009). Psychological ownership within the job design context: revision of the job characteristics model. *Journal of Organizational Behavior, 30*, 477-496

- 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*, 879-903
- Preacher, K. J., & Leonardelli, G. J. (2001). Calculation for the Sobel test: an interactive calculation tool for mediation tests, Accessed 9.11.2009 from <http://people.ku.edu/~preacher/sobel/sobel.htm>
- Ryan, R. M., & Deci, E. L. (2002). An overview of self-determination theory: An organismic-dialectical perspective. In E. L. Deci & R. M. Ryan (Eds.), *Handbook of self-determination research* (pp. 3-36). Rochester, NY: The University of Rochester Press.
- Ryan, R. M., & Deci, E. L. (2006). Self-regulation and the problem of human autonomy: Does psychology need choice, self-determination, and will? *Journal of Personality, 74*, 1557-1585
- Sheldon, K. M., Elliot, A. J., Kim, Y., & Kasser, T. (2001). What is satisfying by satisfying events? Testing 10 candidate psychological needs. *Journal of Personality and Social Psychology, 80*, 325-339
- Song, L. J., Tsui, A. S., & Law, K. S. (2009). Unpacking Employee Responses to Organizational Exchange Mechanisms: The Role of Social and Economic Exchange Perceptions. *Journal of Management, 35*, 56-93
- Spector, P. E. (2006). Method variance in organizational research: Truth or urban legend? *Organizational Research Methods, 9*, 221-232
- Taylor, F. W. (1911). *Principles of Scientific Management*. New York: Harper.
- Thogersen-Ntoumani, C., & Ntoumanis, N. (2006). The role of self-determined motivation in the understanding of exercise-related behaviours, cognitions and physical self-evaluations. *Journal of Sports Sciences, 24*, 393-404

- Tremblay, M. A., Blanchard, C. M., Taylor, S., & Pelletier, L. G. (2009). Work Extrinsic and Intrinsic Motivation Scale: Its Value for Organizational Psychology Research. *Canadian Journal of Behavioral Science, 41*, 213-226
- Ullrich-French, S., & Cox, A. (2009). Using cluster analysis to examine the combinations of motivation regulations of physical education students. *Journal of Sport and Exercise Psychology, 31*, 358-379
- Van Dyne, L., Graham, J. W., & Dienesch, R. M. (1994). Organizational citizenship behavior: Construct redefinition, measurement, and validation. *Academy of Management Journal, 37*, 765-802