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## A Structured Approach to Need for Structure at Work

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# **A Structured Approach to Need for Structure at Work**

**Marjette Slijkhuis**

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## CHAPTER 1

### General Introduction

Modern organizations often allow their employees to design their own jobs and determine their borders. In the Netherlands, more than 46 percent of the organizations are actively involved with “the new world of work” (Gates, 2005), which is also called “Het Nieuwe Werken” (HNW). HNW is a result of the computerization of work, which allows employees to work anytime and anywhere, and, as a result, to carry out their tasks autonomously. In line with the changing roles of the employees, the roles of the leaders also have to change. Leaders who used to manage their employees via autocratic and controlling leadership styles, for example, have to transform into coaches who stimulate their employees to learn and develop, deliver informational feedback, and respond to questions via email or instant messaging. HNW has many advantages for both employees and organizations. Working from home, for example, reduces CO<sub>2</sub> emissions and the number of working places in organizations. Furthermore, the flexible work schedules are supposed to allow employees to combine work and family life more effectively.

A survey among 795 employees that was executed under the authority of the Dutch government showed that 85% were supportive of HNW (Koenen, Vieira, & Verhue, 2010). The workers who were using HNW ( $N = 237$ ), indicated that they experienced more autonomy (74%), higher levels of job satisfaction (56%), decreased levels of stress (39%), and a more peaceful and quiet family life (38%). Although the majority of the employees expect to benefit from HNW, some of them do not. It is likely that the high amounts of freedom and autonomy that follow from HNW elicit some ambiguity and uncertainty. This is particularly difficult for employees who are less likely to cope effectively with uncertainty and ambiguity, such as individuals high in



personal need for structure (Thompson, Naccarato, Parker, & Moskowitz, 2001). Hence, those employees may be less supportive of HNW.

In contrast, employees who fit HNW are required to be highly flexible in dealing with the increased freedom and autonomy, and to develop and learn continuously. Moreover, employees are often allowed to design their jobs and carry out their tasks in line with their personal needs, and should therefore be highly assertive (cf. Van Hoof, 2007). The description of the employee who fits HNW seems to indicate a new stereotype: the stereotype of 'the new worker'. A general view of the 'ideal' worker is not new. Every period has its own stereotype. Since the industrial revolution, insights in how to motivate employees and optimize performance have changed enormously, and so have the stereotypes of the 'ideal worker'.

### **Worker Stereotypes and Motivation**

From the industrial revolution to the late 1940s employees were viewed and treated as machines that were able to tolerate monotonous work up to 16 hours a day. Taylor's (1911) scientific management was based on this thought and was specifically directed at optimizing employees' performance. Job simplification (i.e., the breaking up work into the smallest identifiable tasks) and job specialization (i.e., the assignment of workers to perform small and simple tasks) were considered tools to help supervisors determine this 'best way', and steer their employees' behavior and performance towards the desired standards (e.g., George & Jones, 2001). However, the drawbacks of scientific management were the low levels of employee control and the lack of opportunities for employees to learn and develop. In other words, employee needs were ignored.

In order to deal with these drawbacks, jobs were redesigned during the 1940s and 1950s by practices such as horizontal job enlargement (expansion of the range of activities within a job). However, the outcomes of these job redesign practices were disappointing, which could mainly be attributed to the fact that the tasks remained

simple and employee control low (e.g., Parker & Wall, 1998; 2002). Therefore, in the 1960s jobs were designed in such a way that they could provide employees with the opportunity for growth and development. This job enrichment involved vertical job enlargement because employees were given some of the responsibilities that used to belong to their supervisors (Herzberg, 1966, 1976). Hence, employees were no longer considered machines, but creatures with needs and desires such as autonomy and responsibility, who become motivated by need fulfillment. The notion that employee needs and desires were important predictors of employee responses to their work environment was also included in the Job Characteristics Model (JCM; Hackman & Oldham, 1976).

Although the Hawthorne studies from the mid-1920s already suggested that social factors were more important predictors of employee performance than physical ones (Van Drunen, Van Strien, & Haas, 2004), it was not until the end of the 1970s that the I-O models and theories included the social work environment. Fortunately, the awareness gradually arose that employees do not work in a social vacuum. Colleagues were considered vital to the image of jobs and subsequent responses to job design (Salancik & Pfeffer, 1978). However, later studies showed that objective job characteristics have a much stronger effect on how employees experience their jobs than the perceptions of colleagues of these job characteristics (for an overview, see Taber & Taylor, 1990).

Along with the trend of contingent workers, starting from the mid-1980s, and more advanced computerization of the last decade, the role of the social environment changed accordingly. Temporary contracts not only made employees feel less loyal to their employers, but made it also possible to switch jobs more easily (e.g., De Cuyper & De Witte, 2011). Moreover, advanced computerization allowed employees to work more independently from their direct colleagues and supervisors. Therefore, employee well-being and motivation could no longer be predicted by their immediate work

environment alone (e.g., quality of contacts with colleagues). The possibilities to switch jobs and work flexibly would also contribute to employee well-being. As a result of the changing social environment, employees become more responsible for their own happiness at work. Therefore, they increasingly have to motivate themselves by, for example, setting goals that reflect their intrinsic interests and values (i.e., self-concordant goals; Sheldon & Elliot, 1999).

To summarize, the *worker stereotype* has moved from ‘the worker as an inanimate and insensitive machine’, to ‘the worker with basic psychological needs (autonomy)’, from ‘the worker as a social and sensitive human being’ to ‘the worker as an independent self-motivating individual’. This changing stereotype went hand in hand with (scientific) insights in the motivators of employee behavior. Although stereotypes reflect the views and opinions on employees during specific decades, they change as a consequence of practical experience and new scientific insights. From the 1960s, it was acknowledged that job autonomy was one of the most important motivators (e.g., Herzberg 1966; 1976). Along with this knowledge, employees’ job autonomy indeed increased. In modern organizations, employees are not only responsible for the quality of their output, but also for their own well-being at work. They are expected to change the contents of their jobs or even switch jobs when they need new challenges.

In line with the notion that working life is changing, the founding fathers of the JCM agreed that the model ignores some important aspects of modern work such as the social work environment, and employees’ responsibility for their own job design (Oldham & Hackman, 2010). The JCM is based on the idea that jobs are fixed entities and determined via top-down processes, which was common practice in the 1970s. In modern working life, however, many job descriptions and contents are no longer fixed and employees are more free to determine their working schedules and contents (Oldham & Hackman, 2010; see also Humphrey, Nahrgang & Morgeson, 2007).

## **Job Design and Tolerance for Ambiguity**

Although modern work allows employees to work flexibly and autonomously, not every employee may welcome these 'benefits'. The possibility to make decisions about many aspects of one's job may result in uncertainty and role ambiguity (cf. Burger, 1989). Employees do not clearly know what is expected from them, and, therefore, motivation and performance may decrease. Hence, in order to benefit from job autonomy in terms of motivation and performance, employees also have to be able to deal with the ambiguity and uncertainty that follows from it. Alternatively framed, if people are not able to tolerate ambiguity, autonomy will not be beneficial.

Individual differences in responses to ambiguous and uncertain situations can be explained by the way in which people seek knowledge. Seeking knowledge is a means to attain meaning or understand the world around them, which is a primary human goal (e.g., Thompson, et al., 2001). By understanding their social environment, people can a) promote survival, b) determine pleasant and unpleasant environmental stimuli, and c) avoid doubt. Kruglanski's (e.g., 1988, 1989) theory of 'lay epistemology' describes the cognitive and motivational components of this process of knowledge seeking. The theory assumes that when people encounter new situations, they will a) generate hypotheses to remove doubts, and b) collect evidence to validate these hypotheses. Although the goal of seeking knowledge is universal, people differ in the way they accomplish this goal. Some individuals are motivated to attain quick closure (i.e. make quick decisions), whereas others can attain closure more cautiously and slowly (make mature decisions). The degree to which people are motivated to attain quick closure can, according to Thompson et al. (2001), be explained by individuals' ability to tolerate ambiguity, which is closely related to their Personal Need for Structure (PNS).

People high in PNS will generate fewer hypotheses, and less thoroughly examine information to test them than people low in PNS (Thompson et al., 2001). Therefore, PNS leads to quick decisions and confidence in judgment. Although quick decision making seems to be valuable in modern organizations, it has some drawbacks because of its association with rigid thinking and inflexibility. Taken together, PNS can be considered a way to attain knowledge and process information, which seems to collide with the work characteristics that are the feature of modern organizations, and require some flexibility and tolerance for ambiguity. Therefore, it is interesting to focus on this employee characteristic. To better understand the effects of PNS on individuals' behavior, an overview is given of research that includes PNS as a predictor of a wide scope of behavioral responses.

### **PNS and Behavior**

Several studies have shown that PNS affects information acquisition and processing strategies. High PNS individuals are inclined to stereotype and categorize information according to simple categories (e.g., Moskowitz, 1993; Neuberg & Newsom, 1993; Schaller, Boyd, Yohannes & O'Brien, 1995). High PNS individuals are also likely to use heuristics in order to make sense of their social world. This can be derived from the findings that a) they rate words more positively than low PNS individuals when they have already read them before (Hansen & Bartsch, 2001), b) form illusory correlations based on a percentage estimate more easily (Gordon, 1997), and c) use more emergent and fewer constituent attributes in their impressions formed of surprising combinations (e.g. female mechanic; Hutter et al., 2009). Taken together, to maintain and create a well-organized world, high PNS individuals are inclined to use simple information processing strategies such as stereotyping, categorizing, and impression formation.

A relatively new line of research has extended these results by showing that high PNS individuals' typical way of information processing (use of simple interpretations of social information) is strengthened by mortality salience (e.g., Juhl & Routledge, 2010; Landau, Johns, Greenberg et al., 2004; Vess, Routledge, Landau, & Arndt, 2009). It has been shown, for example, that high PNS individuals are more inclined to use strategies to maintain a just world view (e.g., responsiveness to primacy effects and inconsistency; Landau et al., 2004), whereas low PNS individuals are more likely to explore the world when mortality salience is heightened (Vess et al., 2009).

Another strategy to enhance structure and clarity is conformation to enforced rules and regulations (Jugert, Cohrs, & Duckit, 2009). The tendency to conform not only results in complying with imposed regulations (cf., Roman, Moskowitz, Stein, & Eisenberg, 1995), but also affects problem solving. Especially in stressful situations, high PNS individuals are likely to stick to a specific mental set, although it will decrease rather than increase the potential to solve subsequent problems (Schultz & Searleman, 1998). Rietzschel, De Dreu and Nijstad (2007) have shown a similar pattern. When high PNS individuals are afraid to make wrong decisions (i.e., were high in Personal Fear of Invalidity; PFI, Thompson et al., 2001), they are less likely to perform creatively. However, when high PNS individuals are *not* afraid to make wrong decisions they can positively make use of their PNS. The combination of a high PNS and a low PFI enables them to take a structured approach and persevere within thought categories, which results in the production of more (original) ideas.

### **PNS and Organizational Behavior**

High PNS individuals' tendency to structure their environment by stereotyping and categorizing information according to simple categories may also have implications for their responses to job characteristics. To my knowledge, only a few studies specifically focused on high PNS individuals' organizational behavior. Two studies focused on PNS and leadership styles. Ehrhart and Klein (2001) investigated how

individual differences affect leader preferences (charismatic, relation- and task-oriented leaders), and showed that high PNS individuals prefer task oriented leaders, particularly because these could provide them with clear rules and structure. In a follow-up study, Felfe and Schyns (2006) expected that high PNS individuals were less likely to accept transformational leaders because the leaders' orientations towards change and development would collide with the need for structure and certainty. However, Felfe and Schyns did not find any support for this hypothesis. Hence, high PNS employees prefer task oriented leaders but do not negatively respond to transformational leaders

Three other studies focused on the interaction of PNS and job features and its effects on job strain. Firstly, Kivimäki, Elovainio and Nord (1996) found that high levels of desire for structure (a component of PNS) buffered the symptoms of psychological strain, whereas increased levels of negative response to lack of structure (RLS) intensified symptoms of strain. In a follow-up study, Elovainio and Kivimäki (1999) replicated this finding and showed that high RLS individuals' risk of strain was only found in highly complex jobs. Furthermore, Elovainio and Kivimäki (2001) found that PNS moderated the relation between job characteristics (control and feedback) and role ambiguity. Finally, Heponiemi et al. (2008) showed that RLS moderated the relation between role conflict and work outcomes. Taken together, these studies show that high PNS individuals are likely to respond positively to aspects of their work environment that embody structure (leader behavior), and negatively to aspects of their work that may result in ambiguity (lack of feedback, high levels of complexity).

### **PNS and Job Design**

The empirical overview of PNS-research brings me to the conclusion that PNS is a very relevant moderator of employees' responses to job characteristics that are the features of modern working life. Firstly, experimental studies have shown that PNS influences the way in which people a) make sense of the social world, b) respond to enforced and stressful situations, and c) solve problems. Moreover, field studies have

indicated that high PNS individuals respond positively to job features (e.g., leader behavior) that fulfill their need for structure, and negatively to job features that enhance ambiguity. Thus, PNS seems to be able to predict a wide scope of types of behavior that are especially relevant in organizational contexts. To my knowledge, no studies have directly addressed the question how high PNS individuals' respond to job characteristics in terms of work motivation and job performance. To fill this void, I focus in this dissertation on PNS as a moderator of the relation between job characteristics and work outcomes. I argue that the freedom to make many decisions about an increasing number of aspects of individuals' work may be difficult and frustrating for individuals who cannot tolerate ambiguity and uncertainty, i.e., employees high in PNS. For them, job characteristics featuring autonomy may not be beneficial because they may relate to lack of structure and ambiguity. Therefore, high levels of autonomy will only enhance low PNS individuals' intrinsic work motivation and job performance.

### **Autonomy, Feedback, and Motivation**

To test the expectation that high PNS individuals do not respond as favorably to features of their work that enhance both freedom and ambiguity than low PNS individuals, a definition of autonomy is used that is very relevant in I-O research. Hackman and Oldham (1980, p. 79) defined autonomy in their JCM as "the degree to which the job provides substantial freedom, independence, and discretion to the individual in scheduling the work and determining the procedures to be used in carrying it out." According to the JCM, autonomy is one of the five core job characteristics (next to skill variety, task identity, task significance, and feedback) that would increase employees' intrinsic motivation, job satisfaction and performance, and decrease turnover (Hackman & Oldham, 1976). It is suggested that these five job characteristics increase work outcomes because of their effects on meaningfulness of work (skill variety, task identity and significance), responsibility (autonomy), and



knowledge of results (feedback). Moreover, the model distinguishes between two employee characteristics that could possibly moderate the relation between job characteristics and work outcomes: knowledge and skill, and growth needs. Especially growth need strength was found to moderate the relation between job characteristics and work outcomes. The relation between job characteristics and work outcomes is stronger for employees high in growth needs than for employees low in these needs (for an overview, see Spector, 1985).

A job characteristic that is narrowly associated with employee autonomy is the degree to which situations are controlling versus informational (Deci & Ryan, 1985a; George & Zhou, 2001; Zhou, 1998, 2003). An informational situation is characterized by a climate in which employees can learn and develop, and, therefore, increases intrinsic motivation and creative performance. Controlling situations refer to situations in which employees are told how they should behave, and therefore elicit feelings of pressure. The controlling situations therefore decrease intrinsic motivation and creative performance. Many studies have indeed suggested that controlling (versus informational) situations impede intrinsic motivation and creativity (e.g., Shalley & Perry-Smith, 2001). However, Deci and Ryan (1985b) also noted that controlling versus informational situations would probably not have the same effects across individuals because of differences in motivational orientations.

Taken together, both perspectives on employee motivation acknowledge that situational characteristics do not have the same effects across individuals. Moderators (i.e., growth need strength and motivational orientation) were distinguished that could explain individual differences. In this dissertation, we will specifically focus on the moderating role of PNS because a) this construct may be relevant in explaining individuals' responses to the increasing autonomy and ambiguity in employees' jobs, and, b) unlike growth need strength, only a few studies have focused on employee differences in PNS in an organizational context. PNS could therefore add to the

knowledge about individual differences as moderators of the relations between work design and work outcomes.

### **The Present Dissertation**

New trends in working life increase employee freedom and responsibility. However, research has already indicated that people differ in their responses to job enrichment (see Spector, 1985). Therefore it is to be expected that individual differences also moderate employees' responses to job characteristics that are features of 'the new world of work'. Because this new world is not only characterized by increased autonomy and responsibility, but also by higher uncertainty and ambiguity, particularly employees who desire predictability and certainty and dislike ambiguity (i.e., high PNS individuals) will not favor this method of working. Another reason to include PNS is its influence on a wide range of cognitions and types of behavior that are especially relevant in modern work, such as responses to uncertainty and ambiguity. In the following chapters, we present seven empirical studies to investigate how job characteristics and individual differences in PNS affect organizational attitudes and behavior.

Chapter 2 focuses on how PNS moderates the relation between autonomy, intrinsic motivation and important work outcomes (job satisfaction, turnover intentions, in-role work behavior). Although previous studies have shown that autonomy has many beneficial effects, we argue that high PNS individuals will not benefit from it. For high PNS individuals, autonomy may be associated with increased ambiguity and lack of structure. These negative outcomes will therefore rule out the beneficial effects of autonomy on motivation and work outcomes. In a field study, we test whether the interaction of PNS and autonomy affects employees' work outcomes, and whether this relation can be explained by intrinsic motivation.

In Chapter 3, we focus on how PNS moderates the effects of feedback styles (informational versus controlling), which is related to autonomy. We argue that both controlling and informational feedback may provide employees with clear information about expectations, rules and regulations. Because high PNS individuals desire high amounts of certainty and predictability, controlling (versus informational) feedback styles may *not* impede their intrinsic motivation and (creative) performance. In a field study (Study 3.1), we investigate how PNS moderates the relation between the perception of an Electronic Performance Monitoring (EPM) system (i.e., informational versus controlling) and intrinsic work motivation. More specifically, we expect that only for low PNS employees, the relation between perception of EPM as controlling (informational) was negatively (positively) associated with intrinsic motivation. In Study 3.2, we investigate in an experimental setting whether participants who expect informational evaluations generate more creative ideas than participants who expect controlling evaluations, but only when they are low in PNS.

Chapter 4 focuses on the effects of Close Monitoring (CM), an organizational tool to control employees. In a field study, we investigate whether employees' PNS moderates the negative effects of Close Monitoring (CM) on employees' intrinsic motivation, job satisfaction, and innovative job performance. Negative links between CM and these positive work outcomes are expected, but only for employees low in PNS. In contrast, for high PNS employees, supervisors' close monitoring practices are expected to relate *positively* to intrinsic motivation and job satisfaction. CM could provide them with clear information about rules and regulations and leader expectations, which increase their well-being at work. However, CM will not enhance innovative job performance among these employees because a) high PNS individuals are less likely to perform creatively, and b) CM discourages any creative behavior. Rather, we expect that innovative job performance will only be high when both PNS and CM are low.

In Chapter 5, a closer look is taken at task approach. We argue that high PNS individuals are likely to approach tasks in a structured or algorithmic way (step-by-step) because this approach fits their need for structure. By following strict algorithms or protocols success is guaranteed, which will increase feelings of certainty. A heuristic task approach (the opposite of the algorithmic approach) would not fulfill the need for structure and certainty because it does not guarantee success and therefore increases uncertainty. Another factor that explains high PNS individuals' preferences for algorithmic approaches is their inclination to follow rules and regulations, which is indicated by their tendency to easily comply with authority rules and regulations (Jugert et al., 2009; Thompson et al., 2001). In a field study (Study 5.1), we investigate whether high PNS employees are more likely to approach tasks algorithmically. Study 5.2 elaborates on Study 5.1 by focusing on the causality of this relation. We expect that people high in PNS are more likely to choose the step-by-step plan to draw an alien than low PNS individuals. Study 5.3 extends Study 5.2 by investigating whether the choice for the step-by-step plan explains participants' creativity in the drawing. Participants who choose the step-by-step plan are expected to perform less creatively than participants who freely draw an alien.

Finally, Chapter 6 summarizes and integrates the most important findings. Also the contributions, limitations, and practical implications are discussed.



## CHAPTER 2

### How Need for Structure Moderates the Relation between Autonomy, Motivation, and Work Outcomes

Autonomy is widely believed to be an important job resource. However, autonomy implies a lack of structure and can, therefore, be a burden as well as an asset. Particularly people high in Personal Need for Structure (PNS) may not benefit from higher levels of autonomy. As hypothesized, the findings of an organizational survey study showed that autonomy predicted work outcomes through work motivation, but only for employees low in PNS.<sup>1</sup>

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<sup>1</sup> This Chapter is based on Slijkhuis, J. M., Rietzschel, E. F., Van Yperen, N. W. (2010). *How Need for Structure Moderates the Relation between Autonomy, Motivation, and Work Outcomes*. Manuscript in preparation.

A job in academia may be one of the best examples of a highly autonomous job. Scientists are allowed to make a great number of decisions about many work-related issues, such as research topics, work schedules, and teaching methods. For many employees, this freedom is an asset. However, for some people, autonomy, or the possibility to make decisions about a large number of aspects of a job, may be a burden rather than an asset because autonomy may relate to unclear expectations and lack of structure (e.g., Burger, 1989; Langfred and Moye, 2004). Especially people who are high in need for structure and clarity may have difficulties with the lack of structure that is associated with high levels of autonomy. The idea that job autonomy may not benefit every individual has been largely neglected in organizational scientific research. In many studies and models, it is assumed or argued that autonomy is beneficial: The possibility to make decisions allows people to fulfill their needs and desires, and is, therefore, intrinsically motivating (e.g., Deci & Ryan, 2000). The aim of this study was to show that autonomy increases employees' work motivation, but only among individuals who are low in need for structure.

### **Autonomy and Work Motivation**

In influential organizational models and theories, such as Hackman and Oldham's (1976) Job Characteristics Model, Karasek's (1979) Job Demands-Control model and Demerouti, Bakker, Nachreiner, and Schaufeli's (2001) Job Demands-Resources model, autonomy is argued to be a job characteristic, or a resource, that positively relates to work motivation, job satisfaction, and performance, and negatively relates to turnover intentions and psychological strain. In numerous studies evidence has been found for the positive relations between perceived autonomy, or perceived control, and positive job outcomes (for overviews, see Fried and Ferris, 1987; Häusser, Mojzisch, Niesel, & Schulz-Hardt, 2010; Spector, 1986). In longitudinal field studies, for example, it was found that employees in autonomous work groups reported more favorable work attitudes than employees in structured work groups (e.g., Cordery,

Mueller, Smith, 1991; Wall, Kemp, Jackson, & Clegg, 1986). In intervention studies, it was shown that an increase in autonomy support given by supervisors had positive effects on engagement and autonomous motivation (e.g., Hardré & Reeve, 2009; Reeve, Jang, Carrel, Jeon, & Barch, 2004). Thus, the motivating potential of autonomy has been suggested and supported across different types of theories, models, samples, and research designs.

### **Autonomy and Individual Differences**

Although autonomy is generally considered a resource, it may turn out to be a burden for some individuals. In situations characterized by high autonomy, people are expected to make decisions about (aspects of) their work. We expected that this requirement of independent decision-making might not be motivating for some individuals, because of the uncertainty or ambiguity that follows from it (see Burger, 1989). For example, some employees may perceive the freedom to arrange their own work as ambiguous because it is not specified how they should do this. Particularly for employees who prefer structure and predictability, this type of autonomy may not be motivating at all. Hence, we expected that the effects of autonomy would be moderated by individual differences in Personal Need for Structure (PNS).

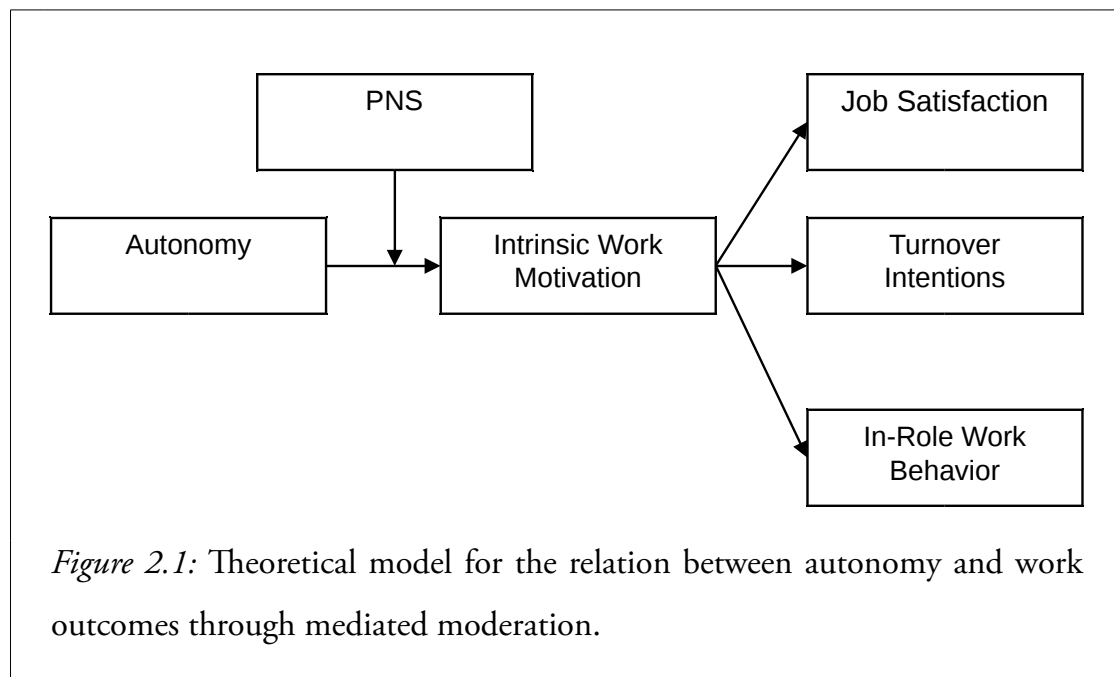
### **Autonomy and Personal Need for Structure**

Personal Need for Structure (PNS) is defined as a need for clarity and intolerance of ambiguity (Neuberg & Newsom, 1993; Thompson, Naccarato, Parker, & Moskowitz, 2001). In general, people high in PNS have a strong preference for structured and predictable situations, and respond negatively to unstructured and ambiguous situations. PNS has important effects on the ways in which individuals process information from their social environment. For example, high PNS individuals are more likely to engage in stereotypical thinking (Neuberg & Newsom, 1993), and they are more inclined to use spontaneous trait inferences in the categorization of behavior (Moskowitz, 1993). Furthermore, high PNS individuals have a strong



tendency to stick to the first available explanation. As a result, they are likely to be more confident in their decisions and less likely to search for alternative explanations (Thompson, Roman, Moskowitz, Chaiken, & Bargh, 1994).

High PNS individuals thus tend to process information in such a way that their need for structure can be satisfied. It is likely that this processing style also affects individuals' appraisals of their work environment, and their subsequent responses to it. Because attaining a sense of structure and predictability is a central concern for high PNS individuals, the lack of structure that accompanies high levels of autonomy may overrule any beneficial outcomes of autonomy. Therefore, we expected that autonomy would be positively related to work motivation, but only for individuals low in PNS (see Figure 2.1). For individuals high in PNS the link between autonomy and work motivation might be absent, or even negative.



## Work Motivation and Work Outcomes

Intrinsic work motivation, or the enjoyment of or interest in a work related activity for its own sake, is a critical variable in organizational science. Its antecedents (including job autonomy) and consequences have been widely examined across organizational studies (for an overview, see Gagné & Deci, 2005). Positive links between intrinsic work motivation and work outcomes have been found in numerous studies. However, to our knowledge, no studies in organizational science have empirically addressed work motivation as an actual mediator of the link between autonomy and job performance. Hence, in our model, we tested the hypothesis that work motivation mediates the relation between autonomy and work outcomes.

We focused on three specific job outcomes that are widely investigated in organizational psychology (see Figure 2.1). Firstly, *in-role work behavior* is arguably the single most important outcome of organizational behavior, at least from an organization's point of view. In-role work behavior is an important antecedent of organizational productivity and success (e.g., Neal & Hesketh, 2001). Secondly, from the perspective of individual employees, *job satisfaction* is one of the most important outcomes of their working life, also because of its positive relation to life satisfaction (e.g., Judge & Watanabe, 1993). It is important for organizations, too, that employees are satisfied and do not leave. Thirdly, *turnover intentions* indicate behavioral intentions that, if executed, may be costly for both organization and employee (e.g., Abelson & Baysinger, 1984).

We expected that the relation between autonomy and these work outcomes would be mediated by work motivation. However, as we argued above, autonomy is not likely to be a motivating variable for employees who are high in PNS. This suggests a moderated mediation model, where motivation acts as a mediator between autonomy and work outcomes, but only for employees who are low in PNS. When PNS is high, there is no relation between autonomy and work outcomes.

## Method

### Participants and Procedure

The participants were 53 employees (53 % were female) from different companies, and their supervisors. The employees' mean age was 33.6 years ( $SD = 13.1$ ) their average organizational and job tenure were respectively 62.2 months ( $SD = 77.2$ ), and 47.2 months ( $SD = 71.5$ ). The organizations can be categorized as service-sector companies (education, government, research bureau). Both employees and their supervisors filled out questionnaires. A research assistant personally delivered the questionnaires to the participants. After filling out the questionnaires, the participants put them in closed boxes that were later collected by the research assistant. The response rate was 47.3 %.

### Measures

**PNS.** We assessed Personal Need for Structure using the 12-item PNS scale developed by Thompson et al. (2001), which includes items like "It upsets me to go into a situation without knowing what I can expect from it", and "I enjoy having a clear and structured mode of life." Cronbach's alpha was .84. Participants rated the statements on a scale that ranged from 1 (*totally disagree*) to 7 (*totally agree*).

**Autonomy** was assessed using the three-item decision authority subscale of the widely used Job Content Questionnaire (JCQ) developed by Karasek (1985). An example of a (reversed) item is "I have little freedom to decide how to do my work." Participants rated the statements on a scale that ranged from 1 (*totally disagree*) to 7 (*totally agree*). Cronbach's alpha for this scale was .74.

**Intrinsic work motivation.** We assessed intrinsic work motivation using a seven-item scale developed for this study, including items like "I enjoy my job", and "I perceive my job to be interesting". Participants rated the statements on a scale that ranged from 1 (*totally disagree*) to 5 (*totally agree*). Cronbach's alpha for this scale was .91.

**Job satisfaction** was assessed using a five-item scale adapted from Bacharach, Bamberger, and Conley (1991). The scale includes items like “How satisfied are you with your current job compared to jobs in other organizations?” Participants rated the statements on a scale that ranged from 1 (*very dissatisfied*) to 7 (*very satisfied*). Cronbach’s alpha for this scale was .84.

**Turnover intentions** were assessed using a five-item scale developed by Mobley and co-workers (Mobley, Horner, & Hollingsworth, 1978; Mowday, Koberg, & MacArthur, 1984). The scale includes items like “I will probably seek another job in the near future.” Participants rated the statements on a scale that ranged from 1 (*totally disagree*) to 5 (*totally agree*). Cronbach’s alpha was .85.

**In-role work behavior** was assessed using the slightly modified five-item scale developed by Williams and Anderson (1991), consisting of items like “The employee fulfills the job requirements.” Supervisors rated the statements on a scale that ranged from 1 (*never*) to 4 (*always*). Cronbach’s alpha was .83.

## Results

Table 2.1 presents means, standard deviations, and zero-order correlations for the variables measured in the study. As expected, autonomy was positively related to intrinsic work motivation. In turn, intrinsic work motivation was positively related to job satisfaction and in-role work behavior, and negatively related to turnover intentions. PNS was not related to any of the variables.

To test the hypothesis that intrinsic work motivation mediates the relationship between autonomy and job attitudes and outcomes, but only for employees with low levels of PNS, we used a procedure developed by Preacher, Rucker, and Hayes (2007), which consists of three steps. All requirements should be met: (a) the predictor and the moderator should significantly predict the hypothesized mediator; (b) the proposed mediator should significantly affect the dependent variable; and (c) the indirect effect of the predictor should be conditional on the level of the moderator (that is, it should be

significant on some levels of the moderator, but not others). In the final step, 95% confidence intervals (CIs) were computed around indirect effects for low PNS (1 *SD* below the mean) and high PNS (1 *SD* above the mean); mediation is indicated by CIs that do not contain zero.

Table 2.1

*Means, Standard Deviations, Zero-order Correlations, and Scale Reliabilities (diagonal axis)*

	<i>M</i>	<i>SD</i>	1	2	3	4	5	6
1. PNS	3.09	0.60	.84					
2. Autonomy	5.11	0.95	-.11	.74				
3. Intrinsic Work Motivation	4.01	0.70	-.02	.33**	.91			
4. Job Satisfaction	5.13	0.93	-.04	.42**	.74**	.84		
5. Turnover Intentions	2.28	1.05	.06	-.20	-.62**	-.53**	.85	
6. In-Role Behavior	3.39	0.42	-.19	.29*	.53**	.46**	-.37**	.83

*Note.*  $n = 53$ . \*  $p < .05$ . \*\*  $p < .01$ . Scale reliabilities are placed at the diagonal axis.

**Job satisfaction.** Analysis findings showed (a) that the interaction of autonomy and PNS significantly predicted intrinsic work motivation ( $B = -0.35$ ,  $SE = 0.11$ ,  $t = -3.09$ ,  $p = .003$ ) (see Table 2.2); (b) that intrinsic work motivation significantly affected job satisfaction (see Table 2.3) ( $B = 0.69$ ,  $SE = 0.09$ ,  $t = 7.27$ ,  $p < .001$ ); and (c) that the indirect effect of autonomy was conditional on PNS: For low PNS, the CI ranged from 0.33 to 0.96, and for high PNS, the CI ranged from  $-0.14$  to 0.36. Thus, autonomy positively affected job satisfaction through increased intrinsic work motivation, but only for employees low in PNS.<sup>1</sup>

Table 2.2

*Interaction of Autonomy and PNS as predictor of Intrinsic Work Motivation (Step A)*

Predictor	<i>B</i>	<i>SE</i>	<i>t</i>	<i>p</i>
Constant	-0.04	0.12	-0.32	.75
Autonomy	0.49	0.13	3.94	<.001
PNS	-0.01	0.12	-0.01	.99
PNS x Autonomy	-0.35	0.11	-3.09	.003

Table 2.3

*Intrinsic Work Motivation as Predictor of Job Satisfaction (Step B)*

Predictor	<i>B</i>	<i>SE</i>	<i>t</i>	<i>p</i>
Constant	5.12	0.08	64.63	<.001
Intrinsic Work Motivation	0.69	0.09	7.27	<.001
Autonomy	0.12	0.10	1.32	.19
PNS	0.01	0.08	0.08	.93
PNS x Autonomy	-0.02	0.08	-0.26	.80

Conditional indirect effects at PNS = mean +/- 1 *SD* (DV = job satisfaction) (step C)

PNS	Boot indirect effect	Boot <i>SE</i>	Boot <i>z</i>	Boot <i>p</i>
-1.00	0.61	0.15	4.07	<.001
0.00	0.36	0.10	3.73	<.001
1.00	0.11	0.13	0.84	.40

**Turnover intentions.** As reported above, (a) the interaction of autonomy and PNS significantly predicted intrinsic work motivation (see Table 2.2); (b) intrinsic work motivation significantly affected turnover intentions (see Table 2.4) ( $B = -0.69$ ,  $SE = 0.14$ ,  $t = -4.88$ ,  $p < .001$ ); and (c) the indirect effect of autonomy (as mediated by motivation) was conditional on PNS. The CI ranged from -1.01 to -0.26 for

individuals low in PNS, and from -0.42 to 0.13 for individuals high in PNS. Thus, autonomy negatively affected turnover intentions through decreased intrinsic work motivation, but only for employees low in PNS.

**In-role work behavior.** As reported above, (a) the interaction of autonomy and PNS significantly predicted intrinsic work motivation (see Table 2.2); (b) intrinsic work motivation significantly affected in-role work behavior (see Table 2.5) ( $B = 0.20$ ,  $SE = 0.06$ ,  $t = 3.25$ ,  $p = .002$ ); and (c) the indirect effect of autonomy (as mediated by motivation) was conditional on PNS. For a low PNS, the CI ranged from 0.06 to 0.30, and for a high PNS, the CI ranged from - 0.04 to 0.12. Thus, autonomy positively affected in-role work behavior through increased intrinsic work motivation, but only for employees low in PNS.

Table 2.4

*Intrinsic Work Motivation as Predictor of Turnover Intentions (Step B)*

Predictor	<i>B</i>	<i>SE</i>	<i>t</i>	<i>p</i>
Constant	2.28	0.11	19.28	<.001
Intrinsic Work Motivation	-0.69	0.14	-4.88	<.001
Autonomy	0.07	0.14	0.49	.63
PNS	0.03	0.11	0.31	.75
PNS x Autonomy	-0.03	0.12	-0.23	.82

Conditional indirect effects at PNS = mean +/- 1 *SD* (DV = turnover intentions)  
(Step C)

PNS	Boot Indirect Effect	Boot <i>SE</i>	Boot <i>z</i>	Boot <i>p</i>
-1.00	-0.63	0.20	-3.16	.002
0.00	-0.37	0.13	-2.77	.006
1.00	-0.12	0.14	-0.82	.41

Table 2.5

*Intrinsic Work Motivation as Predictor of In-Role Work Behavior (Step B)*

Predictor	<i>B</i>	<i>SE</i>	<i>t</i>	<i>p</i>
Constant	3.39	0.05	66.31	<.001
Intrinsic Work Motivation	0.20	0.06	3.25	.002
Autonomy	0.05	0.06	0.76	.45
PNS	-0.07	0.05	-1.32	.19
PNS x Autonomy	-0.03	0.05	-0.53	.60

Conditional indirect effects at PNS = mean +/- 1 *SD* (DV = in-role work behavior)  
(Step C)

PNS	Boot Indirect Effect	Boot <i>SE</i>	Boot <i>z</i>	Boot <i>p</i>
-1.00	0.18	0.06	2.80	.006
0.00	0.10	0.04	2.62	.009
1.00	0.03	0.04	0.78	.43

## Discussion

The present study addressed the relation between autonomy, intrinsic work motivation, and several important work outcomes. It was hypothesized that autonomy would predict work outcomes through intrinsic work motivation, but only for employees low in PNS. The results were completely in line with this hypothesis: for employees low in PNS, autonomy was associated with more favorable work outcomes, and this effect was fully mediated by intrinsic work motivation. For employees high in PNS, however, autonomy was not associated with intrinsic work motivation or work outcomes.

Our results seem to indicate that not every employee benefits from autonomy, which refines earlier findings that autonomy is beneficial for work outcomes in general (e.g., Spector, 1986). As argued above, people high in PNS may perceive autonomy as a



burden rather than an asset because autonomy may relate to unclear expectations and lack of structure. However, our results did not indicate that higher levels of autonomy were negatively related to intrinsic work motivation and work outcomes among high PNS employees, but rather showed that autonomy was not related to these outcome variables. It is possible that for these employees the negative effects of autonomy, i.e., perceived lack of structure, were compensated for by the positive effects of autonomy, and that the negative effects of lack of autonomy were compensated for by the positive effects of structure and clarity. Apparently, certain characteristics predispose some individuals more towards autonomy than others.

One question raised by our data is why high PNS individuals did not appear to respond (either positively or negatively) to autonomy. Interestingly, Heponiemi et al. (2008) found a similar pattern of results. Taken together, these results seem to suggest that individuals high in PNS do not respond to the characteristics of their jobs, such as role conflict and autonomy. A possible explanation is that high PNS individuals process external information in such a way that it fits their existing schemas in order to maintain certainty (e.g., Thompson et al., 1994). When high PNS individuals do not know how to deal with an unfamiliar problem, for example, they may choose to neglect this information because it elicits feelings of uncertainty. Instead, they may reframe the problem as a familiar one, so that they can cling to existing schemas of problem solution (see, e.g., Runco, 1994). In the same vein, employees high in PNS would cling to familiar work characteristics to maintain certainty, even though those are not necessarily intrinsically motivating. In order to avoid a substantial decrease in their intrinsic work motivation, employees may choose to consciously neglect those characteristics and therefore not respond. Of course, this is only speculative; further research is needed to test this explanation.

Our results can also contribute to studies that supported Hackman and Oldham's (1976) Job Characteristics Model by showing that only people high in growth need strength (GNS), or individuals who value personal development and learning, reported more positive work outcomes when a job's motivational potential was high (for overviews, see e.g., Fried and Ferris, 1987; Spector 1985). Like individuals high in GNS, individuals low in PNS were more satisfied and performed better than individuals high in PNS, when autonomy was perceived to be high (e.g., De Jong, Van de Velde, & Jansen, 2001; Fried & Ferris, 1987). However, it should be noted that, although both PNS and GNS affect employees' sensitivity to work characteristics, this does not imply that the individual difference measures are conceptually the same or both ends of a continuum. If anything, PNS and GNS are likely to be negatively related: High PNS individuals' goals to maintain certainty and predictability may prevent them from entering into new and stimulating situations in which they can learn and develop. However, PNS is more than a mere response to situations that elicit uncertainty. PNS mainly affects the way in which individuals acquire and process information, and impose meaning on their (social) world (Neuberg & Newsome, 1993; Thompson et al., 2001). Therefore, PNS and GNS can be considered conceptually different constructs. To address this issue empirically, future research should look into the combined moderating effects of both individual difference measures.

Despite the strengths, there are some limitations that should be mentioned. To measure autonomy, we used Karasek's (1985) decision authority scale that focused on decision-making autonomy (the freedom to make decisions at work). Therefore, it could be hard to generalize our results to other types of autonomy, such as work scheduling autonomy (the freedom to control the scheduling and timing of work), or work methods autonomy (the freedom to control work methods and procedures) (for an overview, see Humphrey, Nahrgang & Morgeson, 2007). Another limitation is that

our study is cross-sectional. Therefore, alternative causal models could explain the data. For example, it is possible that employees who performed well were rewarded with more autonomy by their supervisors. In order to test the predictions concerning causality a longitudinal or experimental design is required.

### **Practical Implications**

From a practical point of view, our results confirm the general notion that, at least for low PNS individuals, autonomy is an important and valuable job characteristic. For high PNS individuals, however, autonomy may not be that important. It is likely that for them structure is a more important job characteristic. For example, high PNS individuals may prefer task-oriented leaders who provide clear standards, norms, and guidelines, whereas individuals who value participation in decision-making might favor charismatic leaders, who use empowerment strategies (see Ehrhart & Klein, 2001). Therefore, individual differences in desire for job autonomy and need for structure will remain an area of tension. Especially when individual differences in PNS are large within a single work group or team, team conflicts about the balance between job autonomy and work-related structure might increase. Leaders could address this conflict by providing employees with both structure and autonomy. A manager should not only provide information about how to solve a problem, but could also give alternative solutions or indicate that employees' own contributions are desirable.

In conclusion, by providing knowledge about the interaction between autonomy and PNS, and its relations with work motivation and work outcomes, we aim to contribute to the realization of stimulating work climates in which every employee can flourish.

**Footnote**

<sup>1</sup>To rule out the possibility that a few high-leverage data-points drove the moderated mediation effect, we calculated Cook's distance, Mahalanobis distance and the Centered Leverage Score (CLS) for each case. For all cases, Cook's Distance was smaller than 1. Two cases were suspicious because of the high values for both Mahalanobis distance ( $> 15$ ) and CLS ( $> \text{Average Leverage}$ ). When we analyzed the data without these cases, the results did not change substantially. Therefore, we decided to include all 53 cases in our analyses.



## CHAPTER 3

## How Evaluation and Need for Structure Affect Motivation and Creativity

Research has shown that evaluation can have negative effects when it is perceived as controlling rather than informational. We hypothesized that Personal Need for Structure (PNS) would moderate the effects of (perceptions of) evaluative situations. Specifically, we expected that informational evaluative situations would be associated with higher motivation and higher creative performance than controlling evaluative situations, but only when PNS is low. In a field study ( $N = 53$ ) and an experiment ( $N = 72$ ), we showed consistently across samples, methods, and outcomes that the positive effects of informational evaluation only existed for individuals who were low in PNS. These findings support the reasoning that high PNS individuals tend to welcome any type of feedback because of its disambiguating potential.<sup>2</sup>

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<sup>2</sup> This Chapter is based on Slijkhuis, J. M., Rietzschel, E. F., Van Yperen, N. W. (in press). *How Evaluation and Need for Structure Affect Motivation and Creativity*.

Organizations need to be flexible and creative in order to survive in a dynamic economic market. Therefore, many organizations try to create and maintain a climate in which creativity can flourish. Examples of conditions that have been found to stimulate creativity are situations in which employees are evaluated in a supportive manner, and situations in which employees feel safe to propose new and improved ways of doing things (e.g., Amabile, Conti, Coon, Lazenby, & Herron, 1996; Anderson & West, 1996). However, past studies also suggest that the organizational environment and characteristics of the employee interactively affect creative performance (George & Zhou, 2001; Oldham & Cummings, 1996). In other words, some contexts may be more conducive (or detrimental) to creativity than others, but this effect is not necessarily the same across individuals. For example, some people have a chronic dislike of ambiguity, and a strong preference for clarity, that is, a high Personal Need for Structure. This is very likely to affect their reactions to contextual variables. This chapter aims to show that the relation between type of evaluation and employees' motivation and creativity is moderated by Personal Need for Structure.

### **Evaluative Situations in the Workplace**

Performance appraisal (the evaluation of employees' job-relevant behavior) and feedback (providing employees with information about their performance and its evaluation) are part and parcel of life in organizations. Appraisal or evaluation of performance can take place episodically, for example, by formal supervisory ratings or appraisal interviews, or more continuously, for example, by Electronic Performance Monitoring (EPM) systems. EPM systems are electronic methods of collecting information about employee performance, such as video camera observation or recording telephone calls (Wells, Moorman, & Werner, 2007). Although evaluation is usually seen as an indispensable tool for effective personnel management (e.g., Cascio & Aguinis, 2011), evaluation and feedback also have the potential of undermining, rather than enhancing, employees' performance. This issue has been studied particularly

extensively in the context of creative performance (e.g., Amabile, 1979; Eisenberger & Rhoades, 2001; Shalley & Perry-Smith, 2001; Zhou, 1998).

The fact that evaluation and feedback can have positive as well as negative consequences is often explained by the style (“feedback style”) in which they are delivered. Usually, a distinction is made between informational and controlling feedback styles (e.g., Ryan, 1982; Zhou, 1998). When supervisors use an *informational* feedback style, they provide helpful information that enables employees to learn, develop, and make improvements with regard to their jobs. They also avoid imposing demands or restrictions on the employee. Typically, informational feedback is presented as an advice, rather than a command (e.g., “it would be a good idea for you to do such-and-so”). In contrast, when supervisors do impose explicit demands or restrictions on employees’ performance, they use a *controlling* feedback style. In controlling feedback or evaluations, the emphasis is on outcomes that an employee must obtain, and the phrasing is usually rather commanding (“you must do such-and-so”). A consequence of controlling feedback is that the employee’s sense of autonomy decreases, which in turn can inhibit motivation and (creative) performance (for an overview, see Deci, Koestner, & Ryan, 1999; cf., Eisenberger, Pierce, & Cameron, 1999).

Several studies across a diversity of samples and contexts have found support for the undermining effect of controlling (as compared to informational) feedback styles. For example, Pittman, Davey, Alafat, Wetherill, and Kramer (1980) found that controlling feedback decreased task engagement (relative to informational feedback). Also, Koestner, Ryan, Bernieri, and Holt (1984) found that placing constraints upon individuals’ behaviors threatened their intrinsic motivation and creative performance, but only when these constraints were framed in a controlling way. Furthermore, Shalley and Perry-Smith (2001) found that participants who expected a controlling evaluation were less intrinsically motivated and performed less creatively than participants who expected an informational evaluation. In a related line of research, Amabile and



Gitomer (1984) found that children made more creative collages when they were free to choose their materials, and Greenberg (1992) found that autonomy regarding task choice and deadlines increased participants' creative performance.

Thus, there is empirical support for the notion that intrinsic motivation and creativity are differently affected by controlling and informational feedback styles. However, although the distinction between these two is often presented as clear-cut, in practice many evaluative situations may actually be relatively ambiguous, and leave considerable room for different perceptions on the part of the individual who is being evaluated.

### **Perception of Evaluative Situations and Individual Differences**

An example of an evaluation system that can be ambiguous is Electronic Performance Monitoring (EPM). EPM *seems* to be a clear example of a controlling appraisal system. Employees subjected to EPM are continuously monitored and their performance is compared to a desired standard. Indeed, several researchers have found that EPM is a source of job strain and negatively affects work motivation (e.g., Carayon, 1993; Smith, Carayon, Sanders, Lim, & LeGrande, 1992), and that this detrimental effect is at least partly due to a loss of perceived control (Varca, 2006). However, a recent study by Wells et al. (2007) shows that the effects of EPM are moderated by employees' perceptions of the monitoring system. Employees can perceive the purpose of EPM as developmental (e.g., to help them improve their performance) or as deterrent (e.g., to discourage misconduct or fraud). Wells et al. (2007) found that employees who perceived the purpose of EPM as developmental rather than deterrent viewed EPM as fairer, and reported higher job satisfaction, higher organizational commitment, and felt more obligated towards the organization to reciprocate. Hence, we argue that whether or not a particular evaluative situation—such as EPM—is beneficial (or detrimental) for work motivation and job performance depends strongly on an individual's perception of that situation. Thus, some employees

may perceive an EPM system as controlling, whereas others may perceive the same monitoring system as informational.

Just as employees may differ in their perceptions of a given monitoring system, employees may also differ in their reactions to feedback based on EPM-generated information. Kuvaas (2007) showed that employees' autonomy orientation (the tendency to attach high importance to autonomy and self-determination) moderated the relation between their perceptions of job evaluation information and work performance. Specifically, for individuals low in autonomy orientation, perceptions of developmental goal setting positively predicted work performance, whereas the opposite was true for individuals high in autonomy orientation. Similarly, Chen and Mathieu (2008) found that the effects of normative versus self-referent feedback were moderated by individuals' goal orientations: The performance of participants who received self-referent feedback improved over time, but only if these participants had a strong learning orientation.

All in all, previous research suggests that (a) people respond differently to controlling and informational feedback and evaluations, (b) many evaluative situations—such as EPM—are ambiguous, and can be perceived as controlling or informational, and (c) individual differences moderate the effects of evaluative situations that are perceived as controlling versus informational. One individual difference variable that seems highly relevant, but which has thus far been neglected in this context, is Personal Need for Structure (Thompson, Naccarato, Parker, & Moskowitz, 2001). We argue that Personal Need for Structure is particularly likely to moderate individuals' reactions to (their perceptions of) evaluative situations.

### **PNS and Evaluative Situations**

Personal Need for Structure (PNS; Thompson et al., 2001) is an individual's need for a structured and unambiguous environment. People who are high in PNS dislike ambiguity, and tend to simplify their social environment. For example, Neuberg

and Newsom (1993) found that participants who were high in PNS were more likely to use stereotypes, and used less complex representations in categorizations of stimuli, than participants who were low in PNS. Furthermore, Moskowitz (1993) found that high PNS individuals used more spontaneous trait inferences in the categorization of behavior. High PNS individuals are also more likely to freeze on the first available explanation, are more confident in decisions, and are less likely to search for alternative explanations (Thompson, Roman, Moskowitz, Chaiken, & Bargh, 1994). Thus, individuals high in PNS prefer a structured and clear social environment, and welcome information that helps them to attain this goal.

Because feedback is a means to provide people with information about their performance, high PNS individuals may perceive any type of feedback as a means that can help to reduce uncertainty about their performances. In line with this reasoning, Ashford and Cummings (1985) showed that individuals who were low in tolerance for ambiguity (a construct that is related to PNS; Thompson et al., 2001) sought feedback more frequently when they experienced role ambiguity. These results underline our argument that for high PNS individuals, feedback can be a means to disambiguate unclear situations. We specifically argue that both controlling and informational evaluative situations have the potential to be disambiguating, because both types of evaluative situations steer future performance into a specific direction. Even though a controlling evaluative situation potentially reduces an individual's perceived autonomy, its directional nature nevertheless reduces ambiguity, and this—we argue—is what matters most for individuals who are high in PNS.

Accordingly, we expect that employees high in PNS perceive both types of evaluation as valuable, because both types of evaluation reduce ambiguity and hence satisfy their need for structure. Therefore, among these employees neither motivation nor creative performance should be affected by type of evaluation. In contrast, employees low in PNS have less need for uncertainty reduction; for these individuals,

the type of evaluation will differentially affect their motivation and performance. That is, among these employees, controlling evaluative situations will be associated with lower motivation and lower creative performance, as compared to informational evaluative situations.

In short, we hypothesize that PNS moderates the effects of (employees' perceptions of) evaluative situations on motivation and performance. Informational evaluative situations will be associated with higher motivation and higher creative performance than controlling evaluative situations, but only when PNS is low. When PNS is high, motivation and performance will not be affected by (employees' perceptions of) evaluative situations.

### **Overview of the Studies**

In order to test this hypothesis, we conducted two independent studies: a field study and a laboratory experiment. In Study 3.1, we tested whether PNS moderates the relation between employees' perception of an EPM system and intrinsic motivation in a work context. In Study 3.2, we experimentally manipulated expected evaluation and measured PNS to test whether PNS moderates the relation between type of expected evaluation and creative performance.

## **Study 3.1**

### **Method**

**Participants.** Fifty-three female call center employees participated in this study. Participants' mean age was 40.59 years ( $SD = 9.32$ ). The response rate was 85.3%. Because age had no significant influence, this factor is ignored in subsequent analyses.

**Procedure.** Before filling out questionnaires, participants received an email from their manager that included a short description of the study. A few weeks after these emails, paper and pencil questionnaires were distributed in the organization. A

research assistant, who was continuously present in the organization for three full days, personally delivered the questionnaires to the participants. In order to further increase the response rate, we raffled off a voucher of 10 Euros among the participants. After filling out the questionnaires, participants could put them in a box or personally hand them to the research assistant.

### **Measures**

*Personal Need for Structure* was assessed using the 12-item Dutch version of the PNS scale (Thompson et al., 2001; Rietzschel, De Dreu, & Nijstad, 2007). High scores on this measure reflect a strong preference for certainty and a dislike for ambiguity. The questionnaire included items such as “I do not like situations that are uncertain”, and “I find that a consistent routine enables me to enjoy life more.” Participants rated the statements on a scale that ranged from 1 (*totally disagree*) to 5 (*totally agree*). Cronbach’s alpha for this scale was .81.

*Perception of the EPM system* was measured with 14 items generated specifically for this study. Seven items measured the degree to which participants perceived the evaluation as controlling (1, 3, 5, 6, 8, 9, and 13). An example item from this scale is: “I experience the collective gathering and delivering of performance data as controlling.” The other items measured the degree to which participants perceived the situation as informational (2, 4, 7, 10, 11, 12, and 14); for example: “I can improve my abilities due to collective gathering and delivering of performance data.” Participants rated their agreement with the statements on a scale that ranged from 1 (*totally disagree*) to 7 (*totally agree*). A factor analysis (Principal Axis Factoring) with Varimax rotation yielded a clear two-factor structure (see Table 3.1): A factor ‘perception as informational’ ( $\alpha = .95$ ), explaining 43.9% of the total variance, and a factor ‘perception as controlling’ ( $\alpha = .83$ ), explaining 16.7 % of the variance. We therefore computed separate mean scores for these subscales.

*Intrinsic work motivation* was assessed using a Dutch version of the 12-item Dutch version of the Work Motivation Scale of Blais, Brière, Lachance, Riddle, and Vallerand (1993, Van Yperen & Hagedoorn, 2003). Cronbach's alpha for this scale was .91. An example item is: "I do this job because I enjoy it". Participants rated the statements on a scale that ranged from 1 (*totally disagree*) to 7 (*totally agree*).

Table 3.1

*Factor Loadings for Principal Axis Factoring with Varimax Rotation of Perception of the EPM-system*

Scale	Perception EPM as Informational	Perception EPM as Controlling
Electronic gathering and collective distributing of performance data are used to control my actions.	.01	.51
I perceive performance data that are distributed as informative and constructive as feedback from which I can learn.	.79	-.24
I perceive electronic gathering and collective distribution of performance data as controlling.	-.31	.72
I perceive electronic gathering and collective distribution of performance data as informative tools to improve my job performance.	.93	-.12
Electronic gathering and collective distribution of performance data are especially used to control employees' work.	-.08	.75
I perceive the performance data that are distributed as manipulative feedback.	-.16	.69
I perceive electronic and collective distribution of performance data as informative.	.90	-.17

Scale	Perception EPM as Informational	Perception EPM as Controlling
Electronic gathering and collective distribution of performance data give me the feeling that my supervisor wants to control me continuously.	-.23	.69
I experience electronic gathering and collective distribution of performance data as means to control my job performance.	.15	.34
Electronic gathering and collective distribution of performance data are especially used to give me informative feedback from which I can learn	.91	-.07
Electronic gathering and collective distribution of performance data give me information to improve my work.	.78	-.02
Electronic gathering and collective distribution of performance data positively affect my development in my job.	.81	-.15
Electronic gathering and collective distribution of performance data make me feel manipulated.	-.32	.69
Electronic gathering and collective distribution of performance data allow me to improve my skills.	.88	-.12

### Results and Discussion

As expected, intrinsic work motivation was positively related to the perception of Electronic Monitoring (EPM) as informational ( $r = .54, p < .001$ ), and negatively related to the perception of EPM as controlling ( $r = -.31, p = .03$ ). Thus, individuals who perceived the evaluative system as more informational were more intrinsically motivated, whereas individuals who perceived the evaluative system as more controlling were less intrinsically motivated. Table 3.2 also shows that the perception of EPM as

controlling was negatively related to the perception of EPM as informational ( $r = -.33$ ,  $p < .05$ ). PNS was not related to either the perception of informational and controlling ( $r = .07$ ,  $p = .61$ ;  $r = .02$ ,  $p = .89$ ) or intrinsic work motivation ( $r = .07$ ,  $p = .61$ ).

Table 3.2

*Means, Standard Deviations and Zero-Order Correlations, Study 3.1 (N = 53)*

	<i>M</i>	<i>SD</i>	1	2	3	4
1. PNS <sup>a</sup>	3.18	0.58	-			
2. Perception of EPM as informational <sup>b</sup>	4.37	1.49	.07	-		
3. Perception of EPM as controlling <sup>b</sup>	4.49	1.05	.02	-.33*	-	
4. Intrinsic Work Motivation <sup>b</sup>	4.92	1.01	.07	.54**	-.31*	-

*Note.* <sup>a</sup> Measured on five-point scale. <sup>b</sup> Measured on seven-point scale.

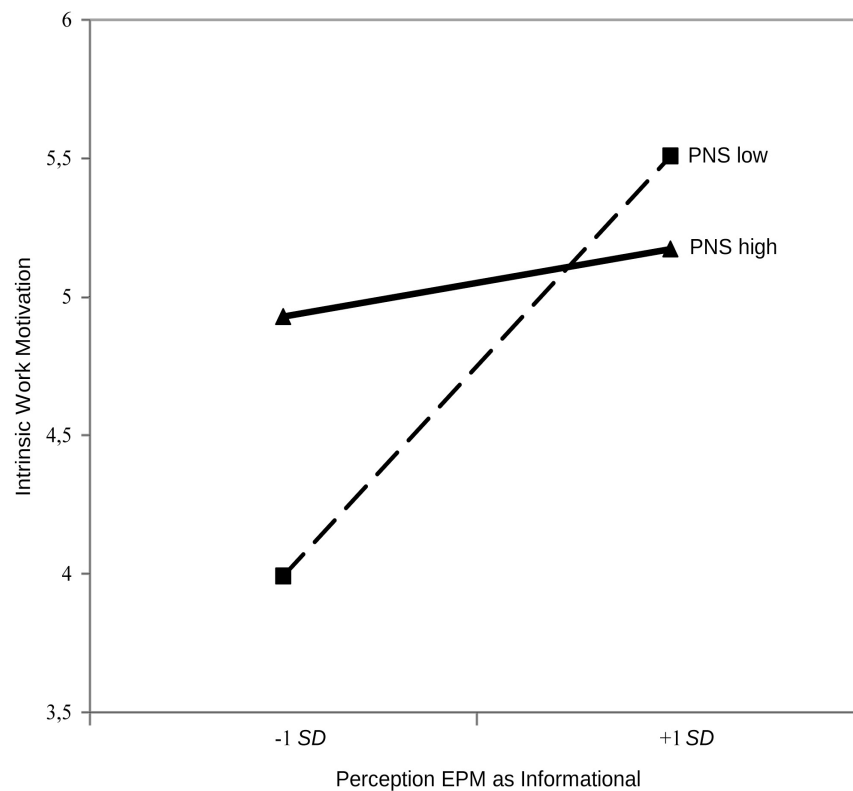
\*  $p < .05$  \*\*  $p < .01$ .

### Effects on intrinsic work motivation.

**Perception as informational.** We computed *Z*-scores for perception of Electronic Monitoring (EPM) as informational and PNS, and regressed participants' intrinsic work motivation on these *Z*-scores and their interaction. A significant main effect of perception as informational was found ( $B = 0.44$ ,  $SE = 0.12$ ,  $t = 3.75$ ,  $p < .001$ , model adj.  $R^2 = .34$ ,  $F = 10.07$ ,  $p < .001$ ; see also Table 3.2): Participants who appraised EPM as more informational showed higher levels of intrinsic work motivation. PNS did not significantly predict intrinsic motivation ( $B = 0.15$ ,  $SE = 0.12$ ,  $t = 1.29$ ,  $p = .20$ ). As predicted, the relation between perception of EPM and intrinsic work motivation was significantly moderated by PNS ( $B = -0.31$ ,  $SE = 0.12$ ,  $t = -2.65$ ,  $p = .01$ ).<sup>1</sup>



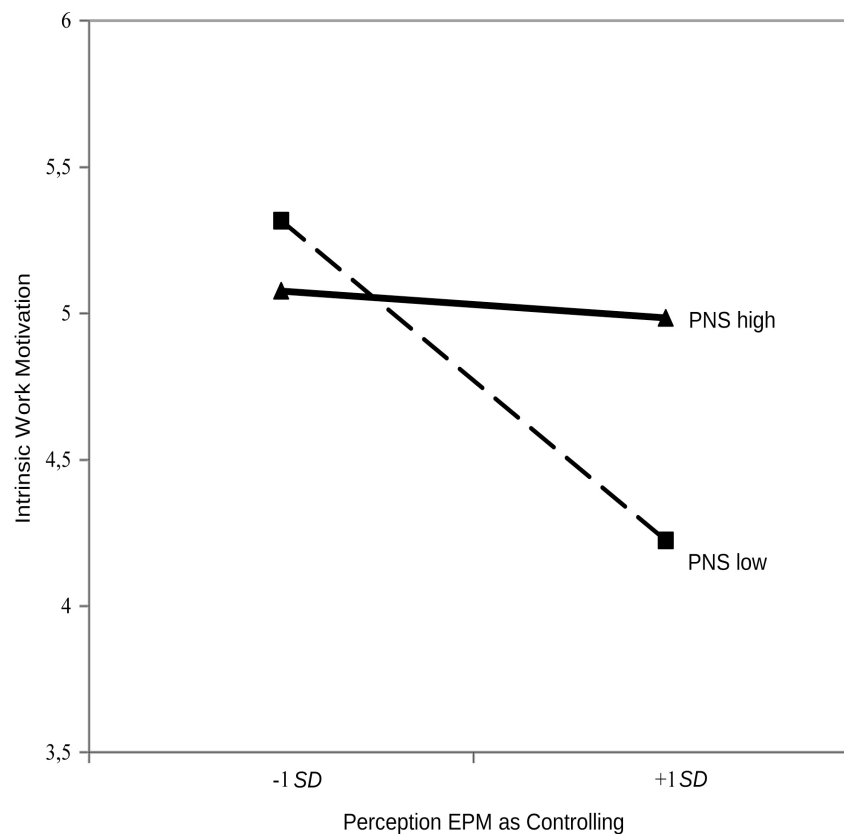
To understand the nature of the interaction, simple slopes analyses were conducted. In line with our hypothesis, the positive relation between perception as informational and intrinsic work motivation was significant for individuals low in PNS ( $B = 0.62$ ,  $SE = 0.12$ ,  $t = 5.33$ ,  $p < .001$ ), and not for individuals high in PNS ( $B = 0.26$ ,  $SE = 0.15$ ,  $t = 1.67$ ,  $p = .10$ ; see Figure 3.1).



*Figure 3.1.* Intrinsic work motivation as a function of the perception of EPM as informational and PNS, Study 3.1

**Perception as controlling.** We regressed participants' intrinsic work motivation on PNS, perception of EPM as controlling ( $Z$ -scores) and their interaction. A significant main effect of perception as controlling was found ( $B = -0.30$ ,  $SE = 0.13$ ,  $t = -2.22$ ,  $p = .03$ , model adj.  $R^2 = .11$ ,  $F = 3.06$ ,  $p = .04$ ; see also Table 3.2): Participants who

appraised EPM as more controlling showed lower levels of intrinsic work motivation. PNS did not significantly predict intrinsic motivation ( $B = 0.13$ ,  $SE = 0.13$ ,  $t = 0.98$ ,  $p = .33$ ). As predicted, the relation between perception of EPM and intrinsic work motivation was moderated by PNS, albeit that this effect was marginally significant ( $B = 0.25$ ,  $SE = 0.15$ ,  $t = 1.72$ ,  $p = .09$ ). Most importantly, simple slopes analyses showed that, in line with our hypothesis, the negative relation between perception as controlling and intrinsic work motivation was only significant for individuals low in PNS ( $B = -0.44$ ,  $SE = 0.15$ ,  $t = -2.95$ ,  $p = .005$ ; for individuals high in PNS,  $B = -.15$ ,  $SE = 0.17$ ,  $t = -0.91$ ,  $p = .37$ ; see Figure 3.2).



*Figure 3.2.* Intrinsic work motivation as a function of the perception of EPM as controlling and PNS, Study 3.1

Thus, our results support the hypothesis that type of evaluation only makes a difference for individuals low in PNS. However, the correlational nature of the study makes it impossible to draw conclusions regarding causality. A second limitation is that we used self-report measures devised especially for this study. Thirdly, in this organizational study, it was not possible to assess creative performance. Therefore, we conducted an experiment in which the type of the evaluation (controlling versus informational) was manipulated and creative performance was measured as an outcome measure. We expected to find a similar interaction as in Study 3.1, i.e., participants in the controlling evaluation condition would perform less creatively than participants in the informational evaluation condition, but only when PNS was low. For participants high in PNS, type of evaluation should not affect creative performance.

### Study 3.2

#### Method

**Participants** were 72 psychology undergraduates, who participated for credits or money (5 Euros, about 7.5 USD). Of the participants, 72% were female. Because sex and type of reward had no significant influence, these factors are ignored in subsequent analyses. The ages of the participants ranged from 17 to 26 years ( $M = 19.88$ ,  $SD = 2.22$ ).

**Procedure.** Participants came to the laboratory individually. After filling out an informed consent form, they were seated in individual cubicles behind a personal computer. In the first part of the study, participants were told (as a cover story) that the researchers were interested in the scale validation of a questionnaire of 'work experience'. Then they completed a questionnaire measuring Personal Need for Structure and Personal Fear of Invalidity (see below), and a number of filler items. The second part of the study involved an ideation task. Participants were asked to generate creative ideas about ways to improve and maintain health. For this idea generation task,

ten minutes were available. To prevent suspicions regarding a possible connection between the questionnaire and the idea generation task, participants were told that they would be participating in two separate studies.

*Expected evaluation* was manipulated with a procedure adapted from Shalley and Perry-Smith (2001). Participants in the controlling evaluation condition were told that the researchers expected them to perform creatively, that their ideas would be rated by a valid and reliable rating system in order to determine whether the ideas were sufficiently creative, and that they would receive a report in which their performance ratings were presented. In contrast, participants in the informational evaluation condition were told that it was important that they benefited from the outcomes of the experiment, and therefore it would be useful for them to perform creatively. Furthermore, they were told that their ideas would be rated for creativity, that these evaluations could help them to improve their creative thinking style, and that they would receive a summary of the ratings, including suggestions from the raters. After the experimental task, participants responded to a number of manipulation checks. At the end of the study, participants were thanked and debriefed.

### **Measures.**

*Manipulation checks.* In order to test whether the manipulation was successful, participants responded to three dichotomies. On each dichotomy, participants had to move a slider to the point that best represented their opinion. For example, if the participant fully agreed with the left anchor (and fully disagreed with the right anchor), the slider would have to be moved completely to the left. In contrast, if the participant agreed equally with both anchors, the slider remained at the middle of the scale. The three dichotomies were: “I performed the task for the researchers” (controlling) versus “I performed the task for myself” (informational); “I perceived the evaluation as controlling” versus “I perceived the evaluation as informational”; and “I perceived the evaluation as restrictive” versus “I perceived the evaluation as nonrestrictive”. For all

three sliders, the controlling anchor was represented by the value 0, whereas the informational anchor was represented with the value 100. Thus, for all three sliders, a higher score indicated that the evaluation was perceived as more informational and less controlling. The scores on these sliders were combined and averaged to a single score (Cronbach's alpha = .67).

*PNS* was assessed with the same measure as in Study 3.1. Cronbach's alpha for this scale was .82.

*Personal Fear of Invalidity* (PFI; Thompson et al., 2001) was measured as a control variable. PFI is individuals' tendency to worry about the consequences of a decision, and to worry about the possibility of making a wrong choice. Because this construct is relevant in evaluative situations, and because it has been conceptually linked to Need for Structure (e.g., Webster & Kruglanski, 1994; but see Neuberg, Judice, and West, 1997), we controlled for PFI in our analyses. PFI was assessed using the 14-item Dutch version of the PFI scale (Thompson et al., 2001; Rietzschel, De Dreu, & Nijstad, 2007). The questionnaire included items such as "I wish I did not worry so much about making errors." Participants rated the statements on a scale that ranged from 1 (*totally disagree*) to 7 (*totally agree*). Cronbach's alpha for this scale was .86.

*Creativity* consists of multiple dimensions, the most important of which is originality (Rietzschel, Nijstad, & Stroebe, 2010; Runco & Charles, 1993). Therefore, the originality of the ideas was rated by two independent coders on a scale that ranged from 1 (*not original*) to 5 (*very original*) (e.g., Rietzschel, Nijstad, & Stroebe, 2006). Interrater reliability was .62 (intraclass correlation; measured with a consistency definition and a two-way mixed model), which we considered to be sufficient (Cicchetti & Sparrow, 1981). For each participant, the mean creativity of his or her ideas was calculated by first averaging the two raters' originality scores into a single score per idea and then averaging across ideas per participant.

## Results and Discussion

**Correlations and manipulation checks.** Descriptives and correlations for the measured variables (manipulation checks, PNS, and creative performance) in this study are reported in Table 3.3. None of the variables were significantly correlated.

Table 3.3

*Means, Standard Deviations and Zero-Order Correlations, Study 2 (N = 72)*

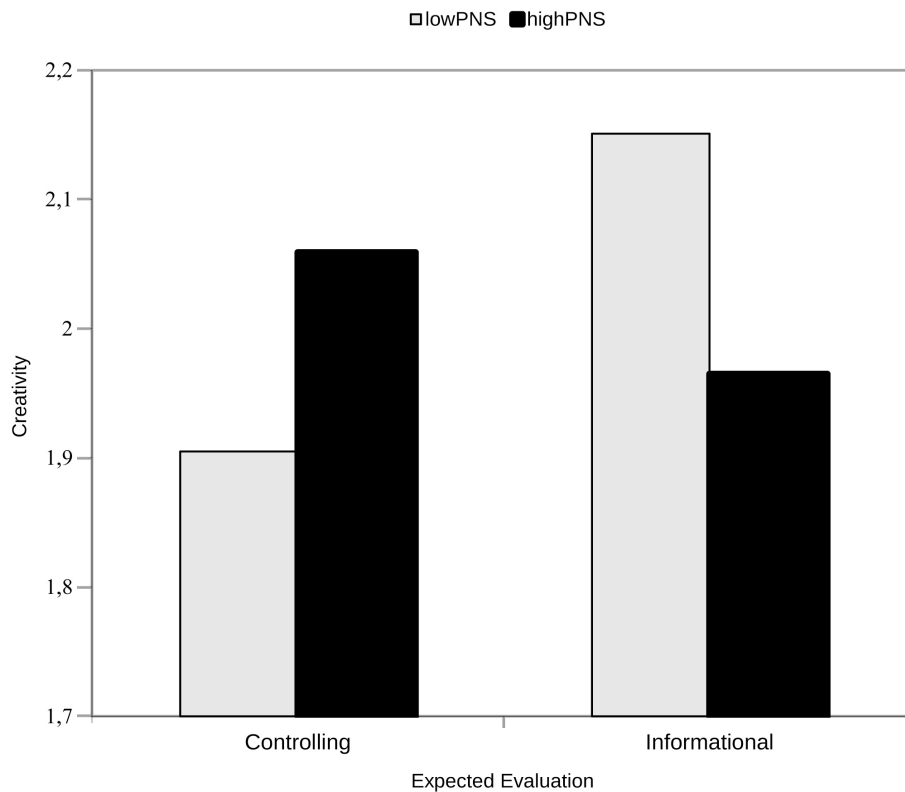
	<i>M</i>	<i>SD</i>	1	2	3
1. PNS <sup>a</sup>	3.89	0.79	-		
2. Manipulation check	56.32 <sup>b</sup>	14.88	.03	-	
3. Creativity	2.02	0.27	.01	.04	-

*Note.* <sup>a</sup> Measured on seven-point scale. <sup>b</sup> Number indicates percentage.

We used an independent samples t-test in order to determine whether the manipulation of expected evaluation was successful. As anticipated, participants in the informational condition rated the expected evaluation as more informational ( $M = 60.38$ ,  $SD = 13.46$ ) than participants in the controlling condition ( $M = 52.03$ ,  $SD = 15.29$ ;  $t(70) = -2.46$ ,  $p = .02$ ). Thus, we concluded that our manipulation was successful. To test whether the manipulation check worked equally well for participants differing in PNS, we regressed the manipulation check on expected evaluation (controlling and informational were effect coded as -1 and 1, respectively), the  $z$ -score of PNS, and their interaction. Obviously, also this analysis revealed the significant main effect of condition ( $B = 4.69$ ,  $SE = 1.74$ ,  $t = 2.70$ ,  $p = .009$ ). Neither the main effect of PNS ( $B = 0.08$ ,  $SE = 2.09$ ,  $t = 0.04$ ,  $p = .97$ ) nor the interaction ( $B = 3.11$ ,  $SE = 2.09$ ,  $t = 1.49$ ,  $p = .14$ ) were significant. Thus, the manipulation worked equally well for participants high and low in PNS.

**Effects on creativity.** To test how creativity of the generated ideas was affected by expected evaluation, PNS, and their interaction, we regressed creativity on the  $Z$ -score of PFI (control variable), expected evaluation condition, the  $Z$ -score of PNS, and the interaction of condition and PNS. No significant main effects of PFI, condition or PNS were found ( $ps > .05$ ). As predicted, the interaction (see Figure 3.3) between the expected evaluation condition and PNS was significant ( $B = -0.08$ ,  $SE = 0.04$ ,  $t = -2.20$ ,  $p = .03$ , model Adj.  $R^2 = .07$ ,  $F = 2.31$ ,  $p = .07$ ). Simple slopes analyses showed that, in accordance with our hypotheses, the effect of expected evaluation on creative performance was only significant for participants low in PNS ( $B = 0.12$ ,  $SE = 0.04$ ,  $t = 2.76$ ,  $p < .01$ ), and not for participants high in PNS ( $B = -0.05$ ,  $SE = 0.05$ ,  $t = -0.86$ ,  $p = .39$ ).

Thus, these results complement those of Study 3.1: PNS moderated the effects of expected evaluation. As hypothesized, controlling evaluation only decreased creative performance (as compared to informational evaluation) for participants who were low in PNS. For participants high in PNS, type of evaluation did not affect creative performance.



*Figure 3.3.* Creativity as a function of expected evaluation and PNS, Study 3.2. Low PNS = 1 *SD* below the mean. High PNS = 1 *SD* above the mean.

### General Discussion

Previous research has shown that controlling evaluation or controlling feedback styles decrease intrinsic motivation and creative performance as compared to informational evaluation or informational feedback styles (e.g., Shalley & Perry-Smith, 2001; Zhou, 1998; 2003). In this chapter, we addressed the question whether Personal Need for Structure moderates these effects. We hypothesized that this effect would occur only among individuals who are low in PNS. For high PNS individuals, any type of evaluation was expected to be welcome, because evaluation reduces their typically high levels of uncertainty and perceived ambiguity. In line with these expectations, we



found that the degree to which employees perceived an Electronic Monitoring (EPM) system as informational was positively related to intrinsic work motivation, whereas perception of EPM as controlling was negatively related to intrinsic work motivation, but only when PNS was low (Study 3.1). Furthermore, participants who expected informational (as opposed to controlling) feedback performed more creatively, but—again—only when PNS was low (Study 3.2). Thus, across samples (employees versus students), methods (survey versus experiment), and outcome measures (intrinsic motivation and creativity), we found support for our hypothesis.

This chapter adds to the literature on evaluation, motivation, and creativity by showing that the effects of the perception of the type of evaluation or feedback style are not the same for each individual. While previous research suggests that informational evaluation is always to be preferred to controlling evaluation (Shalley & Perry-Smith, 2001; Zhou, 1998; 2003), our results suggest that for some people (i.e., those who are high in PNS), it basically does not matter how they are evaluated, as long as a clear evaluation is forthcoming. For them, even controlling feedback may be desirable because of its disambiguating effect.

Another interesting consistency between the two different studies is that the moderating influence of PNS occurred both for perceptions of evaluative systems (Study 3.1) and for objective (manipulated) characteristics of an evaluative situation (Study 3.2). Viewed in isolation, an alternative explanation for the results of Study 3.2 might be that high PNS individuals perceived even the controlling evaluation as informational. In other words, perhaps high PNS individuals simply failed to distinguish between controlling and information evaluation. However, our findings that (a) the manipulation checks in Study 3.2 only showed a main effect of condition, without any moderation by PNS, and (b) there was no correlation between PNS and perceptions of the EPM system in Study 3.1, may rule out this alternative explanation. Although Deci and Ryan (1985a) argued that individual differences (e.g., in locus of

control) affected individuals' perceptions of ambiguous evaluations, PNS does not. Instead, we argue that the explanation for our findings lies in the disambiguating effect of evaluation, which—for high PNS individuals—may render the difference between controlling and informational evaluations relatively unimportant. Additionally, it is possible that PNS affects the degree to which people accept the evaluative information, which, in turn, affects individuals' responses to evaluative situations (e.g., Anseel & Lievens, 2009; Ilgen, Fisher, & Taylor, 1979). High PNS individuals may be more willing to accept controlling feedback because of its potential to reduce ambiguity, whereas low PNS individuals may not accept this feedback because for them, the costs (reduction of autonomy) may overrule the benefits (reduction of ambiguity). Future studies should test the effects of PNS and evaluation controlling for autonomy orientation.

Personal Need for Structure shows considerable conceptual overlap with the construct Need for Closure (NFC), i.e. people's tendency to make quick decisions and to stick to these decisions. Several studies have addressed the effects of NFC on creative behavior (Chirumbolo, Livi, Mannetti, Pierro, & Kruglanski, 2004; 2005), and this may raise the question whether we could equally well have included NFC as a moderator for the effects of expected evaluation. However, Neuberg, Judice, and West (1997) argued that NFC encompasses two distinct epistemic motives, which can be adequately measured with the PNS and PFI scales. We found that the inclusion of PFI as a control variable did not explain additional variance in creativity, nor did it change the predicted pattern of results (i.e., the interaction between condition and PNS was significant, whether PFI was included or not). We therefore conclude that the narrower construct PNS, rather than the broader construct NFC, was the epistemic motive driving the interaction.

Although our findings are consistent across samples, methods, and outcome measures, there are some differences between the two studies that cannot be ignored. With regard to the outcome measures, we found that the intrinsic work motivation of employees high in PNS was relatively high, regardless of their perceptions of an evaluation system (Study 3.1). This finding supports our reasoning that high PNS individuals welcome any type of feedback. In contrast, the results of Study 3.2 showed that the creative performance of participants high in PNS was relatively low, especially when they expected informational evaluation. An explanation for the latter finding could be that high PNS individuals are simply not creative, because creativity requires at least some tolerance for ambiguity (e.g., Chirumbolo et al., 2004; 2005). Taken together, this raises the interesting possibility that the link between intrinsic motivation and creativity in itself is moderated by PNS; future research should address this question.

So far, relatively few studies have addressed the effects of PNS in organizational contexts (e.g. Elovainio & Kivimäki, 2001; Kivimäki, Elovainio, & Nord, 1996; Kruglanski, Higgins, Pierro, & Capozza, 2007). The current work supports the notion that PNS may indeed be a relevant factor in explaining and predicting affect, cognitions, and behavior in organizations. Another important strength of the current work lies in the combination of different settings and methods, which makes it possible to draw causal conclusions and to increase external validity. A limitation is that in Study 3.1 the sample size is very small ( $N = 53$ ). Moreover, the sample consisted only of female employees from one specific type of organization. In order to enhance generalizability and clarify the relation between perception of evaluation systems and creative performance in organizational contexts, data on creative performance should be collected in different types of organizations with a more diverse workforce.

**Practical Implications**

Because creative performance is valued highly in many organizations, insight in the interactive effects of context and individual difference variables on creative performance is not only theoretically important, but also useful from a practical point of view. Previous research has provided insights into the risks and benefits associated with different feedback styles, thereby informing researchers and practitioners that not any type of feedback or evaluation is equally likely to improve (or inhibit) performance. Although an informational feedback style probably never hurts, supervisors would nevertheless do well to take their subordinates epistemic needs into account in order to improve their work motivation and job performances. By providing knowledge about the interaction between evaluation and PNS, this research hopefully contributes to the realization of safe and stimulating work climates in which each employee can flourish.

**Footnote**

<sup>1</sup>In accordance with Chapter 2, we calculated Cook's distance, Mahalanobis distance, and the Centered Leverage Score (CLS) for each case to rule out the possibility that a few high-leverage data-points drove the interaction effect. For all cases, Cook's Distance was smaller than 1. One case was suspicious because of the high value for both Mahalanobis distance ( $> 15$ ) and CLS ( $> \text{Average Leverage}$ ). When we analyzed the data without this case, the results did not change. Therefore, we decided to include all 53 cases in our analyses.



## CHAPTER 4

## Close Monitoring as a Contextual Stimulator: How Need for Structure Affects the Relations between Close Monitoring and Work Outcomes

In this chapter, we argue and demonstrate that employees' Personal Need for Structure (PNS) moderates the negative effects of Close Monitoring (CM) on employees' intrinsic motivation, job satisfaction, and innovative job performance (as rated by their supervisors). In a field study ( $N = 150$ ), we observed a negative link between CM and job satisfaction only for employees low in PNS. For high PNS employees, i.e., employees with a high need for a structured and unambiguous environment, supervisors' close monitoring practices were *positively* related to intrinsic motivation. However, CM did not enhance innovative job performance among these employees. Innovative job performance was only high when either PNS or CM was low.<sup>3</sup>

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<sup>3</sup> This Chapter is based on Slijkhuis, J. M., Rietzschel, E. F., Van Yperen, N. W. (2011). Close Monitoring as a Contextual Stimulator: How Need for Structure Affects the Relations between Close Monitoring and Work Outcomes. Manuscript submitted for publication.

Many motivation theories state that employees' intrinsic motivation and innovative job performance are impeded by external control or forced compliance with imposed rules and regulations, because these practices violate their need to control their (working) life (e.g., Deci & Ryan, 1985a). However, controlling practices, such as close monitoring, also go hand in hand with structure and clarity, and could, therefore, be useful tools for structuring and disambiguating work situations. Especially for individuals with a high need for a structured and unambiguous environment, i.e., individuals high in Personal Need for Structure (PNS; Thompson, Naccarato, Parker, & Moskowitz, 2001), close monitoring may not be detrimental, and may even be beneficial for important work outcomes.

The aim of the present research was to argue and demonstrate that close monitoring is only negatively linked to intrinsic work motivation, job satisfaction, and innovative job performance for employees low in PNS. Close monitoring may fulfill the need of high PNS individuals for structure and clarity, and may accordingly be beneficial for intrinsic work motivation and job satisfaction, and less destructive in terms of innovative job performance.

### **Performance Monitoring and Motivation**

Many organizations use some form of monitoring to keep track of employees' work performance. For example, employees subjected to Electronic Performance Monitoring (EPM; e.g., Lund, 1992) are (usually) automatically and continuously monitored, and their performance is compared with a desired standard. While such elaborate monitoring can have clear benefits for organizations, research suggests that the costs can be high. Several studies have shown that EPM is a source of job strain and negatively affects work motivation (for an overview, see Bates and Holton, 1995; cf. Carayon, 1993; Smith, Carayon, Sanders, Lim, & LeGrande, 1992; Stanton, 2000). Furthermore, research has shown that this detrimental effect is at least partly due to a loss of perceived autonomy (Varca, 2006).

Close Monitoring (CM) is a form of performance monitoring for which this controlling role is even more salient. Supervisors who engage in close monitoring not only keep track of their employees' performance, but also require them to perform and carry out tasks in particular ways (cf. George & Zhou, 2001; Zhou, 2003). Therefore, CM signals to employees that they are expected to conform to supervisory rules, and that behavior not meeting these expectations will have negative consequences. Thus, while monitoring in general is often perceived as controlling, this is even more the case for CM.

### **Close Monitoring and Work Outcomes**

Many studies, across a diversity of samples and contexts, have addressed the undermining effect of controlling (work) situations—e.g., controlling feedback style, limit setting, and supervision—on such outcomes as intrinsic motivation and creative performance (e.g., Koestner, Ryan, Bernieri, & Holt, 1984; Pitman, Davey, Alafat, Wetherill, & Kramer, 1980, Ryan, 1982). The results of these studies underscore the general notion that the controlling aspects of CM are likely to negatively affect employee motivation and performance. However, only a few studies have looked at potential moderators of the effects of CM. For example, George and Zhou (2001) found that CM was more destructive of the creative job performance of employees high in conscientiousness than of those low in conscientiousness, because it encouraged these employees' tendencies to control their impulses and conform to rules and expectations. Moreover, the negative effect of CM on creative performance was buffered when coworkers offered constructive help. In a follow-up study, Zhou (2003) added to these findings by showing that CM especially impeded creative performance among employees low in creative personality surrounded by creative coworkers. Thus, while most research suggests that CM is strongly negatively associated with intrinsic motivation and creative performance, the results of Zhou and colleagues suggest that



these effects are moderated by employee characteristics as well as features of their work environment.

Because of the high prevalence of different forms of performance monitoring (e.g., Botan, 1996), especially in certain occupational groups (e.g., call centers), and because of the risks associated with monitoring practices, it is important to further extend our knowledge about factors that can diminish or even reverse the potential negative effects of CM. In this study, we focused on employee characteristics that can moderate the relation between CM and important work outcomes. Because CM is characterized by supervisors providing unambiguous rules and clear expectations, an employee characteristic that is especially likely to moderate the relation between CM and work outcomes is the desire for structure and dislike of ambiguity: that is, the employee's Personal Need for Structure (PNS).

### **PNS and Close Monitoring**

PNS is an individual's need for a structured and unambiguous environment (Thompson et al., 2001). Research has shown, for example, that participants high in PNS are more likely to use stereotypes and less likely to use complex representations in categorizations of stimuli than participants low in PNS (Neuberg & Newsom, 1993). They also use more spontaneous trait inferences in the categorization of behavior (Moskowitz, 1993), are more likely to freeze on the first available explanation, more confident in decisions, and less likely to search for alternative explanations (Thompson, Roman, Moskowitz, Chaiken, & Bargh, 1994). Furthermore, PNS is related to right-wing authoritarianism (Jugert, Cohrs, & Duckit, 2009). In other words, high PNS individuals are more likely to be submissive to authority, to adhere to conventional norms, and to respond negatively to norm deviants.

Using several cognitive and behavioral strategies, high PNS individuals create and maintain a simple and well-organized world. For two reasons, we expected that PNS would be an important moderator of the effects of CM on employees' motivation

and performance. Firstly, CM may contribute to the fulfillment of employees' need for structure, because imposed rules and regulations reduce ambiguity for high PNS employees and helps them to structure their social world simply. Secondly, high PNS individuals may be more inclined to respond positively to these rules than low PNS individuals because of their high scores on right-wing authoritarianism (Jugert et al., 2009). We elaborate on these arguments below.

### **CM, Motivation, and Satisfaction**

The findings of several studies have indicated that the fulfillment of personal needs enhances individuals' well-being (e.g., Baard, Deci, & Ryan, 2004; Van den Broeck, Vansteenkiste, De Witte, Soenens, & Lens, 2010). Hence, we argue that the potential of CM to reduce uncertainty and ambiguity can fulfill high PNS employees' need for structure and, as a consequence, increase their intrinsic motivation and job satisfaction. This reasoning is in line with Ashford and Cummings' (1985) finding that individuals who were low in tolerance for ambiguity (a construct that is related to PNS; Thompson et al., 2001) sought feedback more frequently than individuals who scored high on this measure.

In addition, CM may benefit high PNS individuals because the controlling practices are in line with their positive attitude to authority (Jost, Glaser, Kruglanski, & Sulloway, 2003; Jugert et al., 2009; Thompson et al., 2001). Hence, the strong emphasis on rules and regulations inherent in close monitoring may not be as demotivating for high PNS individuals as it is for low PNS individuals. In fact, it may contribute to the motivation and job satisfaction of employees high in PNS, because CM signals a more or less authoritarian attitude on part of the organization or the supervisor.

Thus, because of its potential to fulfill high PNS individuals' needs and because of the similarities in attitude to authority, CM may enhance rather than diminish high PNS employees' intrinsic work motivation and job satisfaction. However, previous

research has shown that controlling situations have detrimental effects not only on intrinsic motivation and satisfaction, but also on individuals' creativity and innovative job performance (e.g., Shalley & Perry-Smith, 2001). Therefore, the question arises whether PNS is also likely to moderate the negative relation between CM and innovative job performance.

### **CM and Innovative Job Performance**

Although high PNS individuals are likely to benefit from CM in terms of intrinsic motivation and job satisfaction, it is unlikely that they will benefit from CM in terms of innovative job performance. The first reason for this is that high PNS individuals are, overall, less likely to perform innovatively than low PNS individuals. For example, Schulz and Searleman (1998) showed that high PNS individuals are more inclined to rely on mental sets, which tend to undermine innovative performance. Other research findings have shown that constructs similar to PNS, such as Need for Cognitive Closure, relate negatively to creativity (e.g., Chirumbolo, Mannetti, Pierro, Areni, & Kruglanski, 2004; 2005). Moreover, PNS is negatively related to openness to experience (Neuberg & Newsom, 1993) and positively related to authoritarianism (Jugert et al., 2009; Thompson et al., 2001), which are important (positive and negative, respectively) predictors of creative behavior (e.g., Feist, 1989; McCrae, 1987; Rubinstein, 2003; Schilpzand, Herold, & Shalley, 2001).

A second reason why CM is not likely to stimulate innovative job performance, regardless of PNS, is that CM signals that deviation from rules and regulations will result in negative supervisory responses. In other words, CM encourages employees to adhere to existing practices, and not to take the risks associated with innovative behavior (cf. George & Zhou, 2001). Therefore, it is to be expected that both PNS and CM will undermine innovative job performance. Specifically, it can be expected that there will be a strong negative relation between Close Monitoring and innovative job performance for employees low in PNS, because these employees in particular will feel

controlled by CM. As argued above, for employees high in PNS, the negative relation between CM and innovative job performance is likely to be attenuated by PNS.

In sum, we first hypothesized that PNS would moderate the relation between CM and intrinsic work motivation and job satisfaction in such a way that for high PNS individuals, high levels of CM would be associated with higher intrinsic work motivation and more job satisfaction. For low PNS individuals, negative links were expected to exist between CM, on the one hand, and intrinsic work motivation and job satisfaction, on the other. Second, we expected that PNS would moderate the relation between CM and innovative job performance in such a way that innovative job performance would only be high when both PNS and CM were low. In other words, the negative relation between CM and innovative job performance was expected to be particularly strong for low PNS individuals.

## **Method**

### **Participants and Procedure**

The participants were 193 employees (92.9% male) from two companies (a chemical industries company and a consultancy firm), and their supervisors ( $N = 50$ ). Supervisor ratings were anonymously matched with the employee ratings, resulting in 150 complete employee-supervisor pairs. The employees' mean age was 43.6 years ( $SD = 10.3$ ), and their average job tenure was 6.5 years ( $SD = 7.6$ ). Both employees and their supervisors filled out questionnaires. A research assistant personally delivered the questionnaires to the participants. After filling out the questionnaires, the participants put them in closed boxes that were later collected by the research assistant. The response rate was 48%.

## Measures

**Personal Need for Structure** was assessed using the Dutch version (see Riezschel, De Dreu, & Nijstad, 2007) of the 12-item PNS scale developed by Thompson et al. (2001), which includes items like “It upsets me to go into a situation without knowing what I can expect from it”, and “I enjoy having a clear and structured mode of life.” Cronbach’s alpha was .80. Participants rated the statements on a scale that ranged from 1 (*totally disagree*) to 7 (*totally agree*).

**Close monitoring** was assessed using the slightly modified close monitoring scale developed by George and Zhou (2001). The questionnaire includes items like “I need to do exactly what I am told.” Participants rated the statements on a scale that ranged from 1 (*totally not agree*) to 7 (*totally agree*). Cronbach’s alpha for this scale was .72.

**Intrinsic work motivation** was assessed using a Dutch version of the 12-item Work Motivation Scale developed by Blais, Brière, Lachance, Riddle, and Vallerand (1993; Van Yperen & Hagedoorn, 2003). Cronbach’s alpha for this scale was .91. A sample item is: “I do this job because I enjoy it”. Participants rated the statements on a scale ranging from 1 (*totally disagree*) to 7 (*totally agree*).

**Job satisfaction** was assessed using a five-item scale adapted from Bacharach, Bamberger, and Conley (1991). The scale includes items such as “How satisfied are you with your current job compared to jobs in other organizations?” Participants rated the statements on a scale ranging from 1 (*very dissatisfied*) to 7 (*very satisfied*). Cronbach’s alpha for this scale was .90.

**Innovative job performance** was assessed using the nine-item scale developed by Janssen (2001). Three items refer to idea generation (e.g., “How often does this employee generate creative ideas for improvement?”); three to idea promotion (e.g., “mobilizing support for innovative ideas”); and three to idea realization (e.g., “transforming innovative ideas into useful applications”). Supervisors rated how often

the employees performed the behaviors described in the items on a scale ranging from 1 (*never*) to 7 (*always*). Cronbach's alpha for the whole scale was .95.

## Results

### Zero-order correlations

Table 4.1 presents means and standard deviations, and zero-order correlations for the variables measured in the study. Close monitoring was negatively related to innovative job performance ( $r = -.17, p = .03$ ), but was not related to intrinsic work motivation ( $r = .02, p = .68$ ) or job satisfaction ( $r = -.02, p = .86$ ). PNS was negatively related to innovative performance ( $r = -.26, p = .001$ ) and positively related to close monitoring ( $r = .25, p = .002$ ).

Table 4.1

*Descriptives, Zero-Order Correlations, Scale Reliabilities (diagonal axis)*

	<i>M</i>	<i>SD</i>	1	2	3	4	5
1. PNS	3.98	0.79	.80				
2. Close Monitoring	3.71	0.96	.25**	.72			
3. Intrinsic Work Motivation	5.13	0.84	-.11	.02	.91		
4. Job satisfaction	5.24	1.07	.02	-.02	.51**	.90	
5. Innovative Job Performance	4.09	1.20	-.26**	-.17*	.03	.02	.95

*Note.* \* $p < .05$ , \*\* $p < .01$ ,  $N = 150$

### Regression analyses

We performed regression analyses to test how participants' intrinsic work motivation, job satisfaction, and innovative job performance were predicted by close monitoring (CM), PNS, and their interaction. Predictor variables were standardized, and the interaction term was computed from these standardized scores. To interpret significant effects, unstandardized regression weights were used (Aiken & West, 1991).

**Intrinsic work motivation.** To test how intrinsic work motivation was predicted by CM, PNS, and their interaction, we regressed intrinsic work motivation on organization, job tenure (control variables), CM, PNS, and the interaction term of CM and PNS. As shown in Table 4.2, we found no significant main effects of CM or PNS. The interaction between CM and PNS was significant (see Figure 4.1). Follow-up analyses showed that the relation between close monitoring and intrinsic work motivation was not significant for low PNS individuals ( $B = -0.16$ ,  $SE = 0.10$ ,  $t = -1.56$ ,  $p = .12$ ), and positive for high PNS individuals ( $B = 0.19$ ,  $SE = 0.09$ ,  $t = 2.14$ ,  $p = .03$ ).

Table 4.2

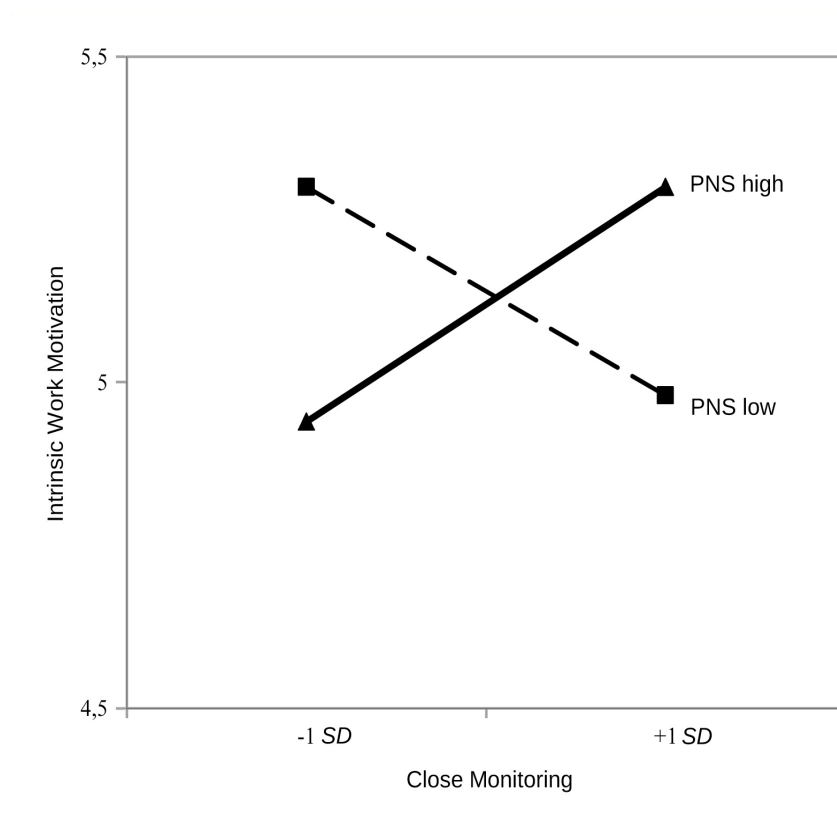
*Summary of Regression Analysis for Variables Predicting Intrinsic Work Motivation with PNS and Close Monitoring*

	<i>B</i>	<i>SE</i>	<i>t</i>	<i>p</i>	Adj. <i>R</i> <sup>2</sup>	Model <i>F</i>	Model <i>p</i>
Model					.09	4.08	.002
Constant	5.13	0.27	19.03	<.001			
Organization	-0.02	0.15	-0.14	.89			
Job Tenure	-0.24	0.07	-3.32	.001			
PNS	-0.01	0.07	-0.16	.88			
Close Monitoring	0.01	0.07	0.20	.84			
PNS * Close Monitoring	0.17	0.06	2.74	.007			

*Note.*  $N = 150$

**Job satisfaction.** Next, we regressed employees' job satisfaction on organization, job tenure (control variables), CM, PNS, and the interaction term. Again, the main effects of CM and PNS were not significant (see Table 4.3). As predicted, the interaction between CM and PNS was marginally significant ( $p < .059$ ; see Figure 4.2). Follow-up analyses showed that the relation between close monitoring and job

satisfaction was negative for low PNS individuals ( $B = -0.26$ ,  $SE = 0.13$ ,  $t = -1.99$ ,  $p < .05$ ), and not significant for high PNS individuals ( $B = 0.05$ ,  $SE = 0.11$ ,  $t = 0.42$ ,  $p = .67$ ).



*Figure 4.1.* Intrinsic work motivation as a function of the Close Monitoring and PNS.

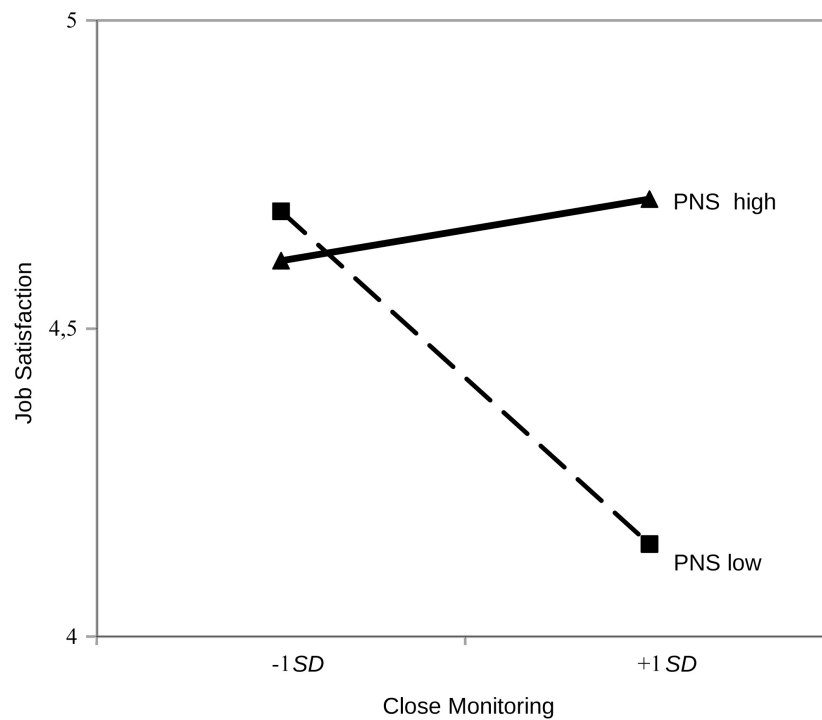


Table 4.3

*Summary of Regression Analysis for Variables Predicting Job Satisfaction with PNS and Close Monitoring*

	<i>B</i>	<i>SE</i>	<i>t</i>	<i>p</i>	Adj. <i>R</i> <sup>2</sup>	Model <i>F</i>	Model <i>p</i>
Model					.05	2.59	.03
Constant	4.54	0.35	13.01	<.001			
Organization	0.39	0.20	1.97	.05			
Job Tenure	-0.28	0.09	-3.03	.003			
PNS	0.12	0.09	1.25	.22			
Close Monitoring	-0.11	0.09	-1.18	.24			
PNS * Close Monitoring	0.16	0.08	1.91	.059			

*Note.* *N* = 150



*Figure 4.2.* Job satisfaction as a function of Close Monitoring and PNS.

**Innovative job performance.** Employees' innovative job performance was rated by their supervisors. Because several employees were supervised (and hence rated) by the same person, the assumption of independence was violated. Indeed, analysis using the deviance test (e.g., Hox, 2010) showed that a multilevel structure fit the creativity ratings better than a single-level structure ( $\chi^2 = 12.48$ ,  $df = 1$ ,  $p < .001$ ). Hence, in order to correct for the nested structure of these data, we analyzed the creativity ratings using a multilevel procedure (using the SPSS Mixed command). In a random intercept model, we regressed employee innovative job performance on organization and job tenure (control variables), CM, PNS, and their interaction. As expected, we found significant main effects of both CM and PNS (see Table 4.4). However, we did not find the expected interaction between CM and PNS (see Table 4.4). Therefore, contrary to our hypothesis, the negative relation between CM and innovative job performance was not stronger for low than for high PNS employees. In fact, the relation between CM and innovative job performance was negative for both low and high PNS employees.

Table 4.4

*Mixed Model Analysis for Variables Predicting Innovative Job Performance with PNS and Close Monitoring*

	<i>B</i>	<i>SE</i>	<i>df</i>	<i>t</i>	<i>p</i>
Constant	1.97	0.46	87.46	4.25	<.001
Organization	1.23	0.25	100.69	4.89	<.001
Job Tenure	-0.08	0.09	143.14	-.929	.35
PNS	-0.20	0.09	143.43	-2.28	.02
Close Monitoring	-0.30	0.09	149.99	-3.20	.002
PNS * Close Monitoring	0.08	0.08	134.14	1.03	.30

*Note.*  $N = 150$

## Discussion

Previous research findings have shown negative effects of (Close) Monitoring on several important work outcomes. In this study, we investigated whether the relation between CM and important work outcomes is moderated by Personal Need for Structure. We argued that Close Monitoring is associated with higher intrinsic work motivation and job satisfaction, but only for high PNS employees. We showed indeed that high PNS employees are more motivated when they feel closely monitored, whereas high PNS employees are not. Moreover, we found that high PNS' employees' job satisfaction does not decrease when employees feel closely monitored, whereas low PNS employees' job satisfaction does. In addition, we found that both PNS and CM are negatively related to innovative job performance. However, contrary to our hypothesis, we did not find that PNS moderates the relation between CM and innovative job performance.

These findings add to the literature on controlling situations, motivation, and creativity by showing that CM can have positive effects on employee well-being at work. Our results suggest that the general implication of Deci and Ryan's (1985a) Self Determination Theory that CM impedes intrinsic motivation does not hold, or does not hold as strongly, for high PNS individuals. These individuals are certainty oriented and motivated to avoid ambiguity and to maintain existing beliefs by categorizing information in simple ways and seeking feedback unobtrusively (cf., Anseel & Lievens, 2007; Roney & Sorrentino, 1987). CM can provide employees with information about – among other things – organizational rules and supervisory expectations, and reduce ambiguity. This fulfills high PNS individuals' need for certainty and enhances their well-being. Furthermore, CM restricts the possibility of deviating from existing norms and regulations, and discourages creative behavior. Therefore, although CM increases intrinsic motivation because it provides certainty, it simultaneously reduces creativity.

In addition, CM seems to fit high PNS individuals' attitudes to authority. Therefore, both the need fulfillment and the support of their attitudes may contribute to the pleasure they get from their work. However, high PNS employees are not able to take advantage of high levels of CM in terms of innovative job performance. This is not surprising because their desire for certainty may collide with any tendency to perform innovatively (see also Chirumbolo et al., 2004; 2005). The new procedures and protocols that may follow from innovation are likely to increase uncertainty. Moreover, their attitudes to authority discourage them from deviating from norms and regulations and performing creatively (cf., Jost et al., 2003). In this research, we focused especially on high PNS individuals' behavior in an organizational setting. So far, relatively few studies have addressed the effects of PNS in organizational contexts, but the work that has been done suggests that PNS is a relevant factor in explaining and predicting work attitudes and behavior in organizations (e.g., Elovainio & Kivimäki, 2001; Kivimäki, Elovainio, & Nord, 1996). The current findings support and extend this notion. Another strength of this research is that we included different sources (i.e., self-reports and leader ratings). However, a limitation that should be mentioned is the cross-sectional nature of our study. Because of this, we cannot say anything about the causality of the observed relations.

### **Practical Implications**

The present findings suggest that CM is not necessarily detrimental to employee well-being; controlling practices such as Close Monitoring can even be beneficial for some employees. For high PNS individuals, certainty and low levels of ambiguity are very important. The clarity and certainty that follow from controlling practices (i.e., CM) may fulfill their need for structure and clarity. For low PNS individuals, however, controlling practices do not offer any benefits because the reduction of ambiguity or maintenance of certainty is not (or is less of) an issue for them. They may feel thwarted

and frustrated because autonomy is taken away from them, which impedes both motivation and innovative job performance.

Clearly, our results need to be replicated and extended; it would be premature to base practical recommendations about the possible benefits of CM on a single field study. Nevertheless, the findings indicate that supervisors should take their subordinates' need for structure into account, particularly when employee work motivation and job satisfaction are at stake. Furthermore, most organizations today need to be flexible and creative in order to survive in a dynamic economic market. Based on the present findings, we may cautiously conclude that when organizations aim to create and maintain a climate in which creativity can flourish, CM practices are probably not the best way to accomplish this.

## CHAPTER 5

## The Roles of Need for Structure and Task Approach in Creative Behavior

In this Chapter, we argue and demonstrate that individuals' Personal Need for Structure (PNS) predicts individual differences in creative performance through individuals' task approaches (i.e., algorithmic versus heuristic). Using the causal-chain methodology, we showed in three studies (one organizational field study and two experiments) that PNS predicted task approach (Studies 5.1 and 5.2), which in turn predicted creative performance (Studies 5.2 and 5.3). Specifically, individuals high in PNS were more inclined to approach their job algorithmically (which provides structure and certainty) whereas individuals low in PNS were more inclined to approach their job heuristically (which evokes ambiguity and uncertainty). In turn, individuals applying an algorithmic task approach performed less creatively than individuals applying a heuristic task approach. Thus, across samples (employees versus students) and methods (survey versus experiment), we found support for the hypothesis that task approach mediated the relation between PNS and creativity.<sup>4</sup>

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<sup>4</sup> This Chapter is based on Slijkhuis, J.M., Rietzschel, E. F., Van Yperen, N. W. (2010). *The Roles of Need for Structure and Task Approach in Creative Behavior*. Manuscript in preparation.

Jobs often require specific task approaches from employees. For employees in the medical sector, such as surgeons and their assistants, it is very important to use strict protocols because every mistake could be devastating. For people who work in the creative sector, such as architects and web designers, however, strict protocols could inhibit the quality of the (creative) output. Apart from task or job requirements, people may differ in their tendencies to approach tasks or jobs: Whereas some individuals are likely to use fixed procedures to carry out tasks, others will try different task approaches over and over again. Particularly individuals high in Personal Need for Structure (PNS), i.e. individuals who prefer high amounts of structure and certainty, are likely to approach tasks according to fixed procedures. This chapter aims to show that people high in PNS are likely to approach tasks according to fixed 'recipes', which explains why high PNS individuals tend to perform less creatively.

### **Algorithmic versus Heuristic Tasks**

In the creativity literature, a distinction is often made between *algorithmic* and *heuristic* tasks. Algorithmic tasks can be carried out according to a specific set of rules or steps that are guaranteed to lead to a solution (e.g., Amabile, 1996; Shin, Jonassen, & McGee, 2003). A typical example of an algorithmic task is a mathematics problem, such as multiplication. When faced with a multiplication problem, the problem-solver knows exactly which strategy to use. Heuristic tasks, in contrast, are tasks for which no set of steps is available and the outcome of which is usually uncertain. Therefore, a person executing a heuristic task needs to find or develop the necessary procedures on the spot. An example of a heuristic task is making a creative drawing, such as drawing an alien (see Ward, 1994).

As noted by Amabile (1996), the difference between algorithmic and heuristic tasks is typically not dichotomous. Many heuristic tasks contain algorithmic elements; for example, painters about to start a new painting may use a fixed procedure to set up their materials, or to create an outline for the painting. Moreover, a task may be

heuristic for one person, and algorithmic for another. Solving a computer problem, for example, is a heuristic problem for many people because they lack the relevant domain knowledge and problem-solving strategies. For a computer expert, the same problem is likely to be algorithmic and solvable through a logical series of steps. Thus, domain knowledge, or the presence or absence of task-specific algorithms, is a determinant of whether a person will approach or perceive a task as heuristic or algorithmic (Amabile, 1996).

However, these differences in task approach need not be related to domain knowledge. For example, Ruscio and Amabile (1999) had participants engage in a building task, and provided participants with videotaped instructions that were either algorithmic or heuristic in nature. There was also a control group, where participants did not receive such instructions at all. Participants (undergraduate Psychology students) were randomly assigned to conditions. Therefore, there were no differences between conditions with regard to domain knowledge or task expertise. Nevertheless, results showed that participants in the heuristic condition were more likely to engage in exploratory behavior, and were less likely to directly imitate the instructions, than participants in the algorithmic condition.

Ruscio and Amabile's (1999) results show that a given task may be approached as algorithmic or heuristic irrespective of domain knowledge or expertise (also see Matuga, 2003), and that these approaches can affect creative behavior. This raises the questions whether (a) the adoption of these different task approaches is associated with chronic individual differences, and (b) the adoption of algorithmic versus heuristic task approaches can explain individual differences in creative performance.

### **Individual Differences in Task Approach**

Many studies have focused on individual difference variables predicting differences in creative performance (for an overview, see Hammond, Farr, Neff, Schwall, & Zhao, 2011), and some of these studies have focused on individual



differences in the way people approach tasks or problems. For example, Reiter-Palmon, Mumford, O'Connor Boes, and Runco (1997) found that individual differences in *problem construction ability* (PCA), or the ability to re-phrase a problem in multiple ways, were positively related to creative performance (cf., Reiter-Palmon, Mumford, & Threlfall, 1999). Furthermore, Mumford, Baughman, Threlfall, Uhlman, and Constanza (1993) found that individual differences in, for example, creative achievement, defensive rigidity, and evaluation apprehension predicted how well participants were able to switch between algorithmic and heuristic tasks. However, to our knowledge, no studies have directly addressed the question which individual differences might predict whether people prefer to approach a task as an algorithmic or a heuristic task.

An essential difference between algorithmic and heuristic tasks is that heuristic tasks are inherently ambiguous and ill-structured, because a priori it is not clear what the best strategy is, nor what the desired end state looks like. Algorithmic tasks, in contrast, are by definition unambiguous, and well-structured: the person performing such a task knows exactly which strategy to use, and which end state he or she is aiming for. It is likely that an individual's preference for an algorithmic or heuristic task approach will be related to the way he or she deals with ambiguous and unstructured situations (e.g., Landa, 1984; MacKinnon, 1962). Individuals who have an aversion towards ambiguity and a desire for structure should prefer algorithmic tasks over heuristic ones, and should be more likely to approach a given task in an algorithmic manner. Thus, differences in task approach could be predicted by individuals' Personal Need for Structure (Thompson, Naccarato, Parker, & Moskowitz, 2001).

### **Need for Structure and Task Approach**

Personal Need for Structure (PNS) can be defined as an individual's need for simple structure and clarity, and intolerance for ambiguity (Neuberg, & Newsom, 1993; Thompson et al., 2001). PNS affects individual information processing; it is, for

example, associated with a tendency to form and rely on stereotypes and trait inferences, and the use of simple cognitive categories (Dijksterhuis, Van Knippenberg, Kruglanski, & Schaper, 1996; Moskowitz, 1993; Neuberg & Newsom, 1993). Further, people high in PNS tend to freeze on the first available explanation, are more confident in decisions, and are less likely to search for alternative explanations (Thompson, Roman, Moskowitz, Chaiken, & Bargh, 1994). More importantly, however, PNS also predicts individual preferences for well-ordered situations and task approaches. For example, Ehrhart and Klein (2001) found that employees high in PNS preferred task-oriented leaders, i.e., leaders who were inclined to guide subordinates by planning and scheduling work tasks. Roman, Moskowitz, Stein, and Eisenberg (1995) found that undergraduate Psychology students (who commonly have to participate in a number of experiments for study credit) participated in experiments sooner, and finished the experiments quicker, than students low in PNS. Further, Diener, Larsen, and Emmons (1984) found that individuals who scored high on need for order and need for cognitive structure were less likely to search for novel situations.

These results suggest that PNS is related to a preference for algorithmic tasks and task approaches. Because these leave relatively little room for creative performance (Amabile, 1996; Ruscio & Amabile, 1999), it is to be expected that this preference also inhibits creative performance. Earlier work suggests that creative performance is indeed negatively affected by PNS or its correlates. For example, Chirumbolo, Livi, Mannetti, Pierro, and Kruglanski (2004; 2005) found that participants were less creative when they had a high Need for Cognitive Closure, a construct that is strongly related to PNS. Barron (1953) found that artists and artistically inclined individuals preferred complex and asymmetrical visual stimuli, whereas the opposite was true for those individuals who had no artistic inclinations. Neuberg and Newsom (1993) found PNS to be negatively related to Openness to Experience, an important predictor of creative performance (e.g., McRae, 1987).

Based on these results, we hypothesized that PNS would affect individuals' task approach. People who are high in PNS should prefer an algorithmic approach, as this fits their need for structure and certainty. Because an algorithmic approach is unlikely to elicit creative behavior, this should lead high PNS individuals to perform less creatively than individuals low in PNS.

### **Overview of the Studies**

To test the hypothesis that PNS affects individuals' preference for an algorithmic (as opposed to heuristic) task approach, and that this in turn affects creative performance, we used an experimental-causal-chain design (see Spencer, Zanna, & Fong, 2005). To test the causal chain, we conducted three studies. In Study 5.1, we investigated in a work context whether the relation between PNS (A) and task approach (B) existed. In Study 5.2, we tested in an experimental setting whether PNS (A) affected individuals' choice for a heuristic versus an algorithmic task approach (B). In Study 5.3, we experimentally manipulated task approach and tested whether task approach (B) affected creativity (C) in the expected direction.

### **Study 5.1**

#### **Method**

**Participants and procedure.** Participants were 43 employees (53% were female) from governmental organizations. Employees' mean age was 44.3 years ( $SD = 11.3$ ). Because sex and age had no significant influence, these factors are ignored in subsequent analyses. The questionnaires were distributed via email.

#### **Measures.**

**Personal Need for Structure** was assessed using a 12-item Dutch version of the PNS scale (Thompson et al., 2001; Rietzschel et al., 2007). High scores on this measure reflect a strong desire for structure. The questionnaire included items such as "I enjoy having a clear and structured mode of life". Participants rated the statements on a scale

that ranged from 1 (*totally disagree*) to 6 (*totally agree*). Cronbach's alpha for this scale was .87.

**Task approach.** Because, to our knowledge, no scale existed to measure an individual's algorithmic or heuristic task approach, we assessed task approach using a 10-item scale especially developed for this study (see Appendix). A high score on this measure reflects an algorithmic task approach, whereas a low score reflects a heuristic task approach. The measure included items like "I always work in the same way" and "I do my work according to fixed rules and regulations". Participants rated the statements on a scale that ranged from 1 (*totally disagree*) to 7 (*totally agree*). Cronbach's alpha for this scale was .71.

## **Results and Discussion**

As expected, PNS was positively related to task approach ( $r = .54, p < .01$ ). Thus, employees high in PNS were more inclined to approach their job algorithmically, or the other way round, and employees low in PNS were more inclined to approach their job heuristically. This result provides initial support for the first part of the hypothesized chain (the relation between A and B).

Obvious limitations of this study are that it only contained self-report measures, and that, additionally, task approach was assessed with a self-developed measure. Replication with an actual behavioral measure of task approach would provide additional support for our hypothesis. We therefore conducted a second study, in which participants were given the opportunity to choose either an algorithmic or a heuristic approach towards a creative task. We hypothesized that participants high in PNS would be more likely to choose the algorithmic task approach, and that participants who chose the algorithmic approach would perform less creatively than participants who chose a heuristic approach.

## Study 5.2

### Method

**Participants** were 44 undergraduates, who participated for credits or money (5 Euros, about 6.6 USD). Of the participants, 80% were female. The ages of the participants ranged from 17 to 24 years ( $M = 19.15$ ,  $SD = 1.51$ ). Because sex and reward had no significant influence, these factors are ignored in subsequent analyses.

**Procedure.** Participants came to the laboratory individually. After filling out an informed consent form, they were seated in individual cubicles behind a personal computer. In the first part of the study, participants were told (as a cover story) that the researchers were interested in the scale validation of a questionnaire of work experience. They then completed the PNS measure, and a number of filler items. The second part of the study involved a drawing task. To prevent suspicions regarding a possible connection between the two tasks, participants were told that they would be participating in two separate studies.

As a cover story, participants were told that the researchers were interested in the relation between creativity and study success. Firstly, participants were asked to draw an original alien, and were provided with an algorithmic task approach: a step-by-step plan that consisted of five pictures. The first picture represented only a basic stick figure-like frame, and in the subsequent pictures elements of the alien (head, body contours, et cetera) were sequentially added. Participants were told that they could choose whether or not to use this step-by-step plan and that they had five minutes to draw the alien. When participants indicated that they understood the instructions, they were left alone for five minutes. After five minutes the researcher came along to collect the drawings. At the end of the study, participants were thanked and debriefed.

**Measures.**

*Personal Need for Structure* was assessed using the same measure as in Study 5.1. In Study 5.2, Cronbach's alpha was .87.

*Task approach* was assessed by determining whether the drawing included a clear frame (as indicated in the step-by-step-plan) or not. Two coders independently rated the drawings and fully agreed whether there was a clear frame or not.

*Creativity* of the aliens was rated by two independent coders. They independently assessed whether the alien a) had a head separate from the body, b) symmetrical features, c) hair, d) two or four limbs, and e) whether it had rounded bodily shapes (e.g., Rietzschel, Nijstad, & Stroebe, 2006). Interrater reliability was .93 (intraclass correlation; measured with a consistency definition and a two-way mixed model), and discrepancies were solved by discussion. For each participant, the mean creativity of the drawing was calculated by averaging the two raters' scores into a single score per drawing.

**Results and Discussion**

**Task approach.** In order to test whether PNS predicted an algorithmic (versus heuristic) task approach (coded as 1 = algorithmic task approach, and 0 = heuristic task approach), we logistically regressed task approach on PNS. As expected, PNS significantly predicted algorithmic task approach ( $B = 0.97$ ,  $SE = 0.48$ ,  $F_{\text{Wald}} = 4.11$ ,  $p = .04$ ). High PNS individuals were more likely to choose the algorithmic task approach, whereas low PNS individuals were more inclined to choose the heuristic approach (they decided not use the step-by-step plan, see Table 5.1).

**Creativity.** To test how creativity was associated with task approach, we executed an independent samples t-test. The mean creativity rating of participants who chose the algorithmic task approach was lower ( $M = 1.18$ ,  $SD = 0.58$ ) than the mean rating of participants who chose the heuristic task approach ( $M = 1.81$ ,  $SD = 1.15$ ,  $t(40.57) = -2.42$ ,  $p = .02$ , equal variances not assumed). In line with our expectations,

participants who chose the algorithmic task approach drew less creative aliens than participants who chose the heuristic task approach.

Table 5.1

*Logistic Regression, Study 5.2 (N = 44).*

	<i>B</i> ( <i>SE</i> )	95% CI for Odds Ratio		
		Lower	Odds Ratio	Upper
Included				
Constant	-3.99 (1.80)			
PNS	0.97 (0.48)	1.03	2.64	6.76

*Note.*  $R^2 = .08$  (Hosmer & Lemeshow),  $.10$  (Cox & Snell),  $.14$  (Nagelkerke).

Model  $X^2(1) = 4.81, p = .03$ .

Taken together, these studies provided strong evidence for the first part of the causal chain, by showing that high PNS individuals were more likely to choose an algorithmic task approach than low PNS individuals. Additionally, we showed that an algorithmic task approach was negatively related to creative performance. However, the relation between task approach and creativity in this study was merely correlational. Therefore, we conducted a third study in which we manipulated task approach to test whether task approach causally affected the dependent variable. We also extended the finding that high PNS individuals preferred to approach tasks algorithmically by testing whether high PNS individuals were more satisfied (than low PNS individuals) when they had been obliged to carry out the task algorithmically, and vice versa, that low PNS individuals were more satisfied (than high PNS individuals) when they had been obliged to carry out the task heuristically.

### Study 5.3

#### Method

**Participants** were 85 undergraduates, who participated for credits or money (5 Euros, about 6.6 USD). Of the participants, 80% were female. The ages of the participants ranged from 17 to 28 years ( $M = 19.44$ ,  $SD = 1.20$ ). Because sex and reward had no significant influence, these factors are ignored in subsequent analyses.

**Procedure.** The same procedure as in Study 5.2 was used. The only difference was that participants were randomly assigned to either the algorithmic task approach (step-by-step plan) condition or the heuristic task approach (no step-by-step plan) condition.

**Task approach manipulation.** Participants in the algorithmic task approach condition received the step-by-step plan used in Study 5.2, and were instructed to use the plan to draw the alien. Participants in the heuristic task approach condition did not receive the step-by-step plan. After drawing an alien, participants were asked how satisfied they were with the approach they had used, and they responded to two manipulation checks. At the end of the study, participants were thanked and debriefed.

#### Measures.

**Manipulation checks.** The participants answered two items about the manipulation: “To draw an alien, I received a step-by-step plan,” and “It was explained to me step by step how to draw an alien.” Participants responded to the statements with *yes* or *no*.

**Personal Need for Structure** was assessed with the same measure as in Studies 5.1 and 5.2. In Study 5.3, Cronbach’s alpha was .81.

**Satisfaction with task approach** was assessed with a single item measure: “I am satisfied with the task approach I used”. Participants rated the statement on a scale that ranged from 1 (*totally disagree*) to 5 (*totally agree*).



**Creativity** of the aliens was rated by two independent coders (see Study 5.2). Interrater reliability was .90 (intraclass correlation; measured with a consistency definition and a two-way mixed model), and discrepancies were solved by discussion.

## Results and Discussion

**Manipulation checks.** As all participants answered the two manipulation check questions correctly, we concluded that our manipulation had been successful.

**Satisfaction with task approach.** To test how participants' satisfaction with the task approach was predicted by condition, PNS, and their interaction, we regressed satisfaction on condition, PNS, and their interaction. We found a significant main effect of condition ( $B = 0.29$ ,  $SE = 0.09$ ,  $t = 3.04$ ,  $p = .003$ ). Participants in the heuristic task approach condition were more satisfied than participants in the algorithmic task approach condition. PNS did not predict satisfaction ( $B = 0.01$ ,  $SE = 0.10$ ,  $t = 0.08$ ,  $p = .94$ ). As predicted, the interaction between condition and PNS was significant ( $B = -0.30$ ,  $SE = 0.10$ ,  $t = -2.96$ ,  $p = .004$ , adj.  $R^2 = .16$ , model  $F = 6.38$ ,  $p = .001$ ) (see Figure 5.1). Follow-up analyses showed that, in accordance with our hypotheses, PNS positively affected satisfaction in the algorithmic task approach condition ( $B = 0.30$ ,  $SE = 0.15$ ,  $t = 2.05$ ,  $p = .04$ ), whereas PNS negatively predicted satisfaction in the heuristic task approach condition ( $B = -0.30$ ,  $SE = 0.14$ ,  $t = -2.09$ ,  $p = .04$ ). Thus, in line with our expectations, high PNS individuals were more satisfied (than low PNS individuals) when they had carried out the task algorithmically, whereas low PNS individuals were more satisfied when they had carried out the task heuristically.

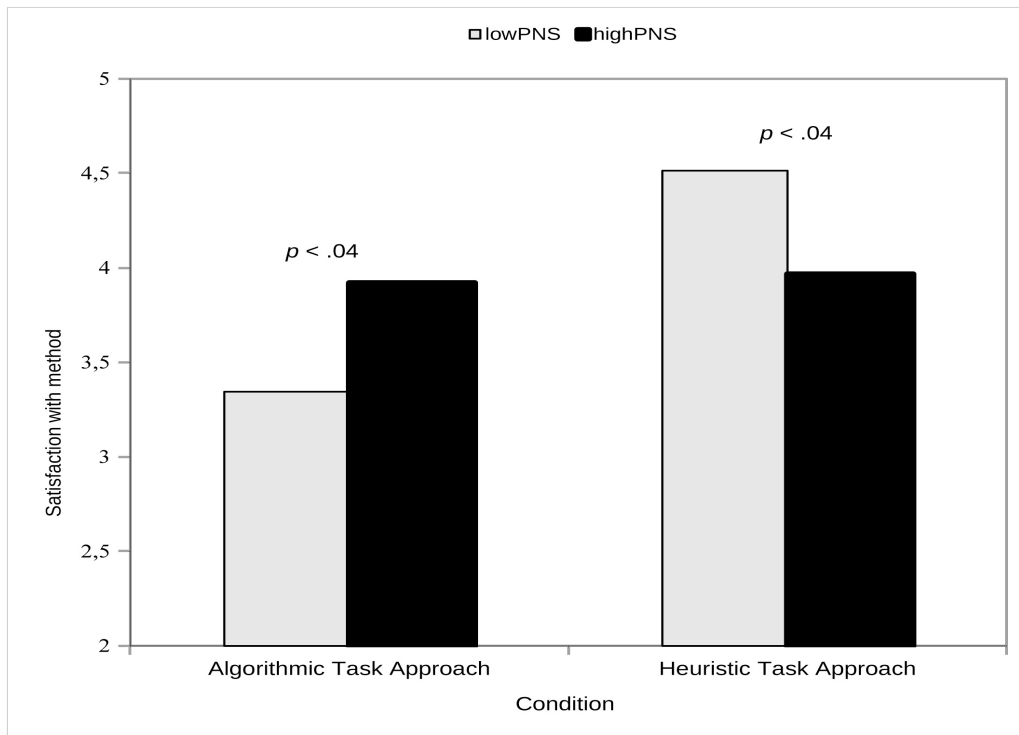


Figure 5.1. Satisfaction with method as a function of task approach and PNS, Study 5.2. Low PNS = 1 *SD* below the mean. High PNS = 1 *SD* above the mean.

**Creativity.** To test how creativity was predicted by task approach, we executed an independent samples t-test. As expected, the mean creativity rating of participants in the algorithmic task approach condition was lower ( $M = 1.15$ ,  $SD = 0.61$ ) than the mean rating of participants in the heuristic task approach condition ( $M = 1.89$ ,  $SD = 1.14$ ,  $t(61.12) = -3.81$ ,  $p < .001$ , equal variances not assumed). In line with our expectations, participants in the algorithmic task approach condition drew less creative aliens than in the heuristic task approach condition.

Taken together, PNS affected individuals' satisfaction with the approach they had used, which affected creative performance in turn. With this finding, we provided evidence for the second part of the causal chain: the relation between task approach and creativity.

### **General Discussion**

In this chapter, we addressed the question whether people's tendency to approach a task algorithmically or heuristically could be explained by Personal Need for Structure, and whether task approach could explain the relation between PNS and creativity. Using Spencer et al.'s (2005) causal-chain methodology, we showed in three studies (one organizational field study, two experiments) that PNS predicted task approach (Studies 5.1 and 5.2), which in turn predicted creative performance (Studies 5.2 and 5.3). Moreover, we found that high PNS individuals were more satisfied when they had used the algorithmic approach, whereas low PNS individuals were more satisfied when they had used the heuristic approach (Study 5.3). Thus, across samples (employees versus students) and methods (survey versus experiment), we found support for the expectation that task approach mediated the relation between PNS and creativity. That is, high PNS individuals were more likely to carry out task algorithmically, which reduced their creative performance. In contrast, low PNS individuals were more likely to carry out tasks heuristically, and consequently, performed more creatively than high PNS individuals.

For the first part of the causal chain—high PNS individuals prefer an algorithmic task approach—our results are in agreement with previous findings that high PNS individuals are inclined to process and structure information in simple and systematic ways (e.g., Neuberg & Newsome, 1993), and prefer highly structured situations (e.g., Ehrhart and Klein, 2001). The use of an algorithmic strategy can help high PNS individuals to make tasks or problems less complex and less ambiguous—a dominant concern for high PNS individuals.

The second part of the chain—the negative relation between algorithmic task approach and creativity—is consistent with the notion that algorithmic tasks are noncreative, and that creativity only occurs when performing a heuristic task (e.g., Amabile, 1996). Ruscio and Amabile (1999) showed that this not only holds for different types of tasks, but also for different approaches towards the same task. Our results extend this work by showing that these different task approaches are predicted by a stable individual difference variable, that is, Personal Need for Structure.

The contribution of this chapter is threefold. First, by showing that preferences for a specific task approach are predicted by PNS, we contribute to the literature on individual differences and situational preferences (e.g., Diener et al., 1984; Spector, Fox, & Van Katwijk, 1999). Secondly, our results contribute to the literature about personality, thinking styles, and creativity (e.g., Chirumbolo et al., 2004; 2005; Haller & Courvoisier, 2010; Zhang & Sternberg 2005). Task approach is apparently an important explanatory variable in the relation between individual difference variables and creative performance. Thirdly, our results underscore the importance of PNS for organizational behavior. So far, relatively few studies have addressed PNS in organizational contexts (e.g., Elovainio & Kivimäki, 2001; Kivimäki, Elovainio, & Nord, 1996; Kruglanski, Higgins, Pierro, & Capozza, 2007). The current work suggests that PNS is an important determinant of the way employees approach their work tasks as well as of their creative performances.

### **Creativity and Structure**

Taken at face value, our results may seem to imply that a structured, step-by-step approach is always detrimental to creativity. Indeed, creativity is popularly associated with freedom and flexibility rather than with structure. However, previous work has shown that a certain amount of structure actually stimulates creative performance. For example, Dennis, Valacich, Conolly, and Wynne (1996) found that people performed more creatively (generated more ideas) when problems were

decomposed into subcategories (also see Dennis, Aronson, Heninger, and Walker, 1999). Thus, although a non-decomposed problem allowed participants to think about the problem as flexibly and heuristically as they liked, forcing participants to address different subcategories of the problem actually helped them to come up with more, and more creative ideas. Interestingly, Rietzschel et al. (2007) found that high PNS individuals who performed creatively (i.e., whose Personal Fear of Invalidation was low), did so by persevering within semantic categories (as opposed to switching flexibly between semantic categories). Similarly, Rietzschel et al. (2006) found that participants who focused on a subcategory of a given problem generated more original ideas within that subcategory.

To explain these and other results, De Dreu, Baas, and Nijstad (2008) proposed the Dual Pathway Model of Creativity, which states that creative performance can be attained by a flexible, broad approach, or by a focused, persistent approach. In combination with our results, this suggests that high PNS individuals' algorithmic task approach is not incompatible with creative performance, as long as they are motivated (and allowed) to persevere. Future research should address how, and under what circumstances, an algorithmic task approach does and does not contribute to creative performance.

### **Practical Implications**

Insight in individual differences in PNS, task approach and creativity is not only theoretically important but also very useful from a practical point of view. Creative performance and flexibility are highly valued in organizations. Therefore, algorithmic task approaches would seem to be increasingly ineffective in the current organizational climate. Perhaps high PNS individuals will be most effective, and most satisfied, in jobs that require algorithmic approaches rather than flexibility and creativity. However, as mentioned above, creativity cannot only be attained by flexibility but also by persistence (De Dreu et al., 2008). For supervisors who wish to stimulate creative

performance, this poses the interesting challenge to create working conditions where the algorithmic work style of their high PNS subordinates leads to persistence and creative performance.



## CHAPTER 6

### Summary and Discussion

As a result of IT technology, working life is changing. Modern employees are allowed to work anytime and anywhere. Therefore, modern workers experience increasing amounts of freedom and responsibility in their jobs. However, for some individuals the freedom to make decisions about many aspects of their work may not be beneficial. For them, the lack of rules and regulations and the ambiguity that may follow from high autonomy will make their jobs more unclear and ambiguous (cf. Burger, 1989). Individuals who are especially likely *not* to benefit from high levels of autonomy are individuals who dislike ambiguity and desire structure and certainty, i.e., individuals high in Personal Need for Structure.

#### **Chapter 2**

In Chapter 2, we addressed the question whether PNS moderates the relation between job autonomy, motivation, and important work outcomes. Previous studies have shown that autonomy is beneficial for employees' motivation and performance (e.g., Humphrey et al., 2007). However, we argued that autonomy could instill some sense of ambiguity and uncertainty (see also Burger, 1989). When employees are allowed to make decisions about many job related aspects, for example, this may result in unclear expectations, rules and regulations. For employees high in PNS, work related factors that indicate ambiguity and uncertainty may be especially salient, and this ambiguity and uncertainty will cancel out the beneficial effects of autonomy. As hypothesized, a field study showed that intrinsic work motivation mediated the relation between autonomy, and work outcomes (job satisfaction, turnover intentions, and in-role work behavior), but only for low PNS employees. For high PNS individuals there is no relation between autonomy and motivation. Taken together, high PNS employees



are less likely to benefit from high autonomous jobs in terms of low turnover intentions and high performance because autonomy does not intrinsically motivate them.

### **Chapter 3**

Besides autonomy, the feedback that is provided by the supervisors is also an important predictor of work outcomes. Chapter 3 therefore focuses on how PNS moderates the effects of feedback (style) on work outcomes. Two feedback styles can be distinguished. Whereas controlling feedback styles refer to practices such as telling people how they should perform, and therefore diminish intrinsic motivation and creative performance, informational feedback is directed at learning and improvement of previous performance, and therefore increases intrinsic motivation and creative performance (e.g., Deci & Ryan, 1985a; Shalley and Perry-Smith, 2001). We argued that both controlling and informational feedback can be beneficial for high PNS individuals because both can provide employees with information and disambiguate unclear situations. As expected, we found in a field study (Study 3.1) that the perception of an electronic performance monitoring system as controlling (versus informational) was negatively (versus positively) related to intrinsic work motivation, but only for low PNS individuals. Moreover, Study 3.2 showed that when participants expected to receive controlling (versus informational) feedback about their creative ideas, they performed less creatively, but only when they were low in PNS. In other words, high PNS individuals' intrinsic motivation and creative performance were unaffected by either their perception of the EPM-system or the type of feedback. Thus, the results seem to indicate that high PNS individuals are indifferent to the way in which evaluations are delivered as long as they provide them with structure and clarity.

### **Chapter 4**

Chapter 4 focused on how employees' PNS moderates the negative relation between Close Monitoring (CM) and important work outcomes (intrinsic motivation, job satisfaction, and innovative job performance). We argued that CM not only

functions as a means to control employees, but can also provide employees with work related information. High PNS individuals would therefore benefit from CM in terms of motivation and satisfaction. However, CM was not expected to enhance innovative job performance among these employees because a) high PNS individuals are less likely to perform creatively, and b) CM discourages any creative behavior. Rather, we expected that innovative job performance would only be high when both PNS and CM are low. In a field study, a negative link between CM and job satisfaction was shown, but only for employees low in PNS. In contrast, for high PNS employees, i.e., employees with a high need for a structured and unambiguous environment, supervisors' close monitoring practices were found to *positively* relate to intrinsic motivation. In addition, we found, contrary to our hypothesis, that the relation between CM and innovative job performance was negative for both low and high PNS employees. That is, innovative job performance is only high when either PNS or CM is low. Hence, controlling practices increase high PNS individuals' well-being at work, but not their creative performance.

## **Chapter 5**

In Chapter 5, we focused on how PNS predicts individual differences in creative performance through individuals' task approaches (i.e., algorithmic versus heuristic). We argued that high PNS individuals are likely to approach tasks in a structured or algorithmic way (step-by-step) because by following strict algorithms or protocols success could be guaranteed, which enhances certainty (cf. Amabile, 1996). Algorithmic task approaches would also suit high PNS individuals because they fit their tendencies to a) engage in information processing strategies that could simplify their social world (e.g., Neuberg & Newsom, 1993) and b) comply with authority rules and regulations (Jugert, Cohrs, & Duckitt, 2009). Using the causal-chain methodology, we showed in three studies (one organizational field study and two experiments) that PNS predicted task approach (Studies 5.1 and 5.2), which in turn predicted creative

performance (Studies 5.2 and 5.3). Specifically, individuals high in PNS were more inclined to approach their job algorithmically (which provides structure and certainty), whereas individuals low in PNS were more inclined to approach their job heuristically. In turn, individuals applying an algorithmic task approach performed less creatively than individuals applying a heuristic task approach. Thus, across samples (employees versus students) and methods (survey versus experiment), we found support for the hypothesis that task approach mediated the relation between PNS and creativity. In other words, people high in PNS are less likely to perform creatively because of their tendency to approach tasks algorithmically.

### **Contributions**

As was indicated above, the studies that were described in the previous chapters were quite diverse in terms of methods, designs, and samples. Moreover, the research was based on a wide scope of theories, such as, the Job Characteristics Model (Hackman & Oldham, 1976), Self-Determination Theory (Deci & Ryan, 1985a), and the theory of Lay Epistemology (Kruglanski, 1988; 1989). Therefore, this dissertation adds to several fields of I-O research.

Firstly, the results add to the scarce knowledge about the role of PNS in organizational contexts by showing that PNS moderates the relation between job characteristics (autonomy and feedback style) and work outcomes. In line with Elovainio and Kivimäki (1999), who found that job complexity was negatively related to job stress among high PNS individuals, we showed that autonomy, another job characteristic in Hackman and Oldham's (1976) Job Characteristics Model, was not beneficial for high PNS individuals. The findings that high PNS individuals do not benefit from increased autonomy in their jobs could be explained by the ambiguity and uncertainty that may follow from it, and which undermine the beneficial effects on intrinsic motivation and performance. Moreover, Chapter 5 indicates that high PNS individuals' responses to job characteristics can also be explained by differences in

preference for task approach. High PNS individuals can fulfill their need for structure by approaching tasks algorithmically. This approach requires effort and perseverance rather than flexibility (cf. Rietzschel et al., 2007).

Secondly, the results contribute to studies that focused on moderators of responses to job design, such as growth need strength (GNS), i.e., the value of personal development and learning, as a moderator of the relation between job characteristics and outcomes (for overviews, see e.g., Fried and Ferris, 1987; Spector 1985). Like individuals high in GNS, individuals low in PNS were more satisfied and performed better when autonomy was perceived to be high rather than low (e.g., De Jong, Van de Velde, & Jansen, 2001; Fried & Ferris, 1987). However, although the effects of the moderators seem to be comparable, the reason *why* people low in GNS and high in PNS do not benefit from enriched jobs may differ. It is likely that individuals low in GNS do not benefit from enriched jobs because they are not oriented towards opportunities for growth, whereas individuals high in PNS do not benefit from enriched jobs because they are not oriented towards practices that enhance freedom to make decisions. Rather, they are focused on certainty and ambiguity reduction.

Thirdly, by showing that the effects of feedback style and close monitoring were not the same across individuals (Chapters 3 and 4), this dissertation indicates that the assumption of Deci and Ryan's (1985a) self-determination theory that controlling situations decrease intrinsic motivation and creative performance does not apply to every employee. Rather, our results indicate that for high PNS employees controlling situations are beneficial, at least in terms of motivation and job satisfaction. This effect can be explained by high PNS individuals' orientation towards certainty, which would make the elements in controlling practices that enhance certainty (and decrease ambiguity) more salient. Moreover, controlling situations such as Close Monitoring mostly specify the algorithms that the employees could or should use, and therefore contribute to high PNS individuals' needs.

Fourthly, the finding that high PNS individuals are more likely to use an algorithmic task approach contributed to the scarce literature about individual differences, task approach, and creativity (cf. Amabile, 1996). However, high PNS individuals' tendency to take an algorithmic approach does not necessarily mean that high PNS individuals cannot perform creatively at all. Previous research has shown that high PNS individuals are able to perform creatively by persevering idea generation within specific categories, but only when they are not anxious to make wrong decisions (Rietzschel et al., 2007).

Taken together, this dissertation is based on a large range of theories and perspectives, and can therefore contribute to different fields of IO-research. However, the research findings that were presented in this dissertation not only answered many questions but also raised some new questions, which could be the starting points for future research.

### **Limitations and Future Research**

In this dissertation, we focused on the moderating role of PNS of the relation of job features that relate to autonomy and individual work outcomes. Although the results are very consistent and informational, they do not say anything about other important organizational variables such as team performance, leadership styles, and job type.

**Diversity in teams.** In most organizations, employees work in a team setting. Some previous work has already addressed the influence of PNS on team performance. Chirumbolo and colleagues (2004, 2005) reported that teams consisting of individuals high in Need For Closure (NFC; a concept that is similar to PNS) performed less creatively than teams consisting of individuals low in NFC. An interesting extension of this research would be to investigate teams that consist of both high and low PNS individuals.

Diversity research has indicated that diversity in teams often results in relation or task conflicts, which are likely to decrease team satisfaction and performance, especially in highly complex tasks (for an overview, see De Dreu & Weingart, 2003). However, other studies reported that task (or process) conflicts can also positively affect team satisfaction and performance (for an overview, see Jehn, Greer, & Rupert, 2008). The inconsistent results seem to suggest that the relation between type of conflict and work outcomes is moderated. Differences in PNS may result in a wide range of perspectives (e.g., task approaches) which may elicit task or process conflicts. Moreover, high PNS individuals are less likely to tolerate alternative perspectives. Therefore, in teams that include certain high PNS individuals and in which diversity is high, task conflicts may not only result in decreased satisfaction and performance but also in relation conflicts. Future studies should investigate the (moderating) role of PNS in diverse teams.

**PNS and leadership style.** In Chapter 4, it was shown that high PNS individuals respond more favorably to close monitoring practices than low PNS individuals. CM can be considered a leadership style in the sense that it has some overlap with task oriented and autocratic styles: Leaders who keep close tabs on their employees are likely, for example, to tell their subordinates exactly how to behave (task oriented), and to do so in an authoritarian way (autocratic). Therefore, this finding may have some implications for leadership research. It would be interesting to know whether high PNS individuals also positively respond to task oriented and autocratic leaders in terms of motivation and satisfaction. Ehrhart and Klein (2001) already demonstrated that high PNS individuals were more attracted to task oriented leaders than charismatic leaders. These types of leaders would be able to create an unambiguous work environment by providing clear structures. Charismatic leaders, in contrast, desire change and development and would, therefore, be more inclined to create an unpredictable work environment

**Job type and in-role work behavior.** In this dissertation, the field studies that were described in Chapters 2-5 report interaction effects of PNS and work characteristics on important work outcomes across several types of jobs and organizations. However, it is likely that in-role work behavior is closely intertwined with type of job and its description. Jobs descriptions of architects, for example, would involve more creative tasks than those of assembly line workers. Therefore, the in-role behavior that is expected of an architect will involve more innovative and creative elements than that of an assembly line worker. In the same vein, innovative job performance also differs across several types of jobs. To perform innovatively, an assembly line worker would have to generate fewer brilliant ideas than a scientist. Thus, supervisor ratings of employee behavior are likely to depend on the job description and the nature of the work. Future studies should therefore investigate how both PNS and job type affect the relation between job features and work outcomes.

**Needs-supplies.** As a result of their personal preferences and needs, high PNS individuals respond to their work environment differently. For them the aspects of a situation that can enhance certainty and clarity may be more salient than for low PNS individuals. The reasoning that high PNS individuals focus on different aspects of work environment than low PNS individuals, may also explain why SDT principles do not hold as strongly for high PNS individuals. Contrary to the previous findings that controlling situations lead to lower intrinsic motivation and creative performance (e.g., Shalley & Perry-Smith, 2001), the results of Chapter 2 and 3 showed that high PNS individuals do not respond as favorably to autonomy and informational feedback as low PNS individuals. Moreover, the results of Chapter 4 indicated that controlling situations may even motivate them.

A possible explanation for these findings can be found in the needs-supplies perspective on Person-Organization fit (e.g., Caplan, 1987; Kristof, 1996). According to this perspective, people high in PNS are more likely to perceive a subjective fit when

they have the feeling that some elements in their work environment have the potential to satisfy their needs and desires. When autonomy is low, for example, high PNS individuals may perceive a fit because low autonomy may imply clear rules and regulations (cf. Burger, 1989). The same reasoning applies to close monitoring and controlling feedback because both have the potential to provide people with clarity and predictability. In future studies, it would be interesting to focus on high PNS individuals' perceptions of their work environment, and see how these perceptions affect their (behavioral) responses.

**Dimensionality of PNS.** In line with most studies that are involved with PNS, in this dissertation PNS is treated as a one-dimensional construct. However, PNS can also be divided into two subscales, that is, desire for structure (DFS) and negative response to lack of ambiguity (RLS; Neuberg and Newsom, 1993). Although both subscales are highly correlated, they are conceptually different, which can be derived from the studies of Elovainio and Kivimäki (1999) and Kivimäki et al. (1996), which showed that DFS and RLS even result in opposite responses in terms of stress.

Another distinction that is intuitively very appealing is the difference between need for cognitive structure (NCS), and the ability to achieve cognitive structure (AACS; Bar-Tal, Kishon-Rabin, & Tabak, 1997; Bar-Tal, Raviv, & Spitzer, 1999). It may be obvious that a high need for structure does not necessarily mean that people are also able to satisfy this need. When people are afraid to make wrong decisions (i.e. are high in fear of invalidity), for example, people are not likely to make quick decisions and are, therefore, unable to fulfill their need for cognitive structure satisfactorily. AACS, which includes both the ability to structure (e.g., meet deadlines, create routines) and PFI (no doubt about decisions), could therefore be a useful measure to investigate how high PNS individuals respond to situations in which they have to make many decisions. Previous research has indicated that individuals who are both high in NCS and AACS invested less time in decision making in conflict situations, than



individuals who are low in AACCS (Bar-Tal et al., 1997; 1999). This result suggests that high PNS individuals who are able to make quick decisions are capable of removing ambiguity efficiently and are, therefore, expected to be most satisfied in ambiguous situations, which increases job performance. This reasoning is also in line with Rietzschel et al. (2007) who showed that high PNS individuals who were able to make quick decisions and remove doubts (low in fear of invalidity) performed more creatively than high PNS individuals who were not able to make quick decisions because of their high fear of invalidity. Future studies could address the moderating role of AACCS and fear of invalidity in the relation between PNS and work outcomes.

**Autonomy and ambiguity.** In Chapters 2-4 was shown that high PNS individuals respond differently to work situations that affect autonomy. It is a reasonable explanation that autonomy goes hand in hand with uncertainty and ambiguity, because it is obvious that strict rules and regulations, and controlling leader behavior impede the possibility to act autonomously (and creatively). However, the empirical studies did not address the question how (role) ambiguity and uncertainty can explain high PNS employees' behavior. Further research should therefore investigate how ambiguity can explain high PNS employees' responses to autonomous situations.

**Intrinsic motivation** is an important predictor of (work) behavior (e.g., Deci & Ryan, 1985a; Hackman & Oldham, 1976). Self-determination theory, for example, states that intrinsic motivation mediates the relation between work features (e.g., autonomy, feedback) and performance (e.g., Gagné & Deci, 2005). Although many studies have shown that intrinsic motivation mediates the relation between environmental features and performance (e.g., Halvari, Ulstad, Bagøien, & Skjesol, 2009; Kuvaas & Dysvik, 2009), other studies could not report that intrinsic motivation mediates this relation (e.g., Shalley & Perry-Smith, 2001). Therefore, these findings seem to suggest that intrinsic motivation does not always act as a mediator. Dysvik and

Kuvaas (2011) argued that the relation between autonomy and performance may also depend on the level of intrinsic motivation. They found that employees only benefit from job autonomy when they are intrinsically motivated to do their work. This pattern of results is similar to the findings that were discussed in Chapters 2 and 3 that autonomy and informational feedback enhanced (creative) performance, but only for low PNS individuals. Like people low in intrinsic motivation, high PNS individuals may not be motivated to use the full potential of high autonomy (e.g., freedom to explore and try out new things), and therefore do not benefit from it. Future studies should address the role of PNS and motivation in the relation between job features and performance.

### **Practical Implications**

To conclude, this dissertation stresses that high PNS individuals benefit from different job characteristics (autonomy, performance monitoring) and leader behaviors (feedback style) than individuals low in PNS. Whereas high PNS individuals seem to be motivated by increased levels of clarity in their work, low PNS individuals' motivation increases when autonomy enhances. Hence, individual differences in PNS will have implications for personnel selection and assessment as well as leader behavior. After reading this dissertation, it should be clear that not putting the right person in the right place has detrimental effects on employees' motivation and performance. The results seem to suggest that it may be worthwhile to a) measure a candidate's need for structure during the selection process, b) see whether the candidate fits the job's requirements and characteristics, and c) hire the candidate who meets these requirements best. Thus, it is important for organizations to realize how much independence and responsibility they can expect from employees, and hire employees that can deal with low (or high autonomy). The results from Chapters 2-5 seem to indicate that high PNS individuals would particularly flourish in well-organized jobs that can be carried out algorithmically, whereas low PNS individuals would pine away

in these jobs. Low PNS individuals, however, would be better off when they are assigned to highly autonomous jobs that can be carried out heuristically.

Although the world is changing with the computerization of most work, a large number of employees still have close (face-to-face) connections with their supervisors. These connections are very influential in determining employee behavior because leaders can determine how much responsibility they assign to the employees, for example. As was indicated before, PNS affects how individuals respond to certain job features. To optimize employee motivation and performance, leaders should therefore treat their employees in such a way that they can fulfill their need for structure. In other words, they should key the amount of autonomy and structure to individual differences in PNS. However, it should be noticed that for some leaders it will be easier to adapt their leadership styles to employee needs and wishes. Transformational leaders may be more capable of dealing with individual differences than autocratic leaders. Although high PNS individuals would prefer these autocratic or task oriented leaders, low PNS individuals would not (cf. Ehrhart & Klein, 2001). Finally, high PNS individuals are more likely to flourish in organizations that are well-organized (e.g., hierarchical organizations), and less likely to support “Het Nieuwe Werken” than in organizations that are more loosely organized and that allow employees to work anytime and anywhere.

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## NEDERLANDSE SAMENVATTING

## Summary in Dutch

Het werkende leven verandert. In veel moderne organisaties bepaalt niet langer de leidinggevende waar of wanneer medewerkers werken, maar doet de medewerker dit zelf. Deze verandering wordt ook wel aangeduid als “Het Nieuwe Werken” (HNW) en kan het best begrepen worden vanuit ontwikkelingen in de IT. Deze maken het mogelijk dat medewerkers tijd- en plaatsafhankelijk kunnen werken. Hoewel deze flexibiliteit voor velen positief is, zal niet iedereen er baat bij hebben. De grote vrijheid die gepaard gaat met HNW kan ambiguïteit en onzekerheid met zich meebrengen. Dit zal vooral lastig zijn voor mensen die het moeilijk vinden om te gaan met ambiguïteit en onzekerheid, zoals mensen met hoge behoefte aan structuur en zekerheid ofwel *Personal Need for Structure* (PNS).

In Hoofdstuk 2 staat de vraag centraal of PNS de relatie tussen werkautonomie, motivatie en belangrijke werkuitkomsten beïnvloedt. Eerder onderzoek heeft laten zien dat autonomie de motivatie en prestatie van medewerkers verhoogt (e.g., Humphrey et al., 2007). Autonomie kan echter ook resulteren in onduidelijkheid en ambiguïteit (cf. Burger, 1989). Deze ambiguïteit zal vooral voor medewerkers met een hoge PNS saillant zijn en de positieve effecten van autonomie opheffen. In lijn met onze verwachtingen toonden we in een veldstudie aan dat motivatie alleen de relatie tussen autonomie en werkuitkomsten verklaarde voor medewerkers met een lage PNS. Voor mensen met een hoge PNS was geen relatie tussen autonomie en motivatie. Daarom zullen medewerkers met een hoge PNS niet gemotiveerder zijn en beter presteren in banen waarin zij veel autonomie ervaren dan in banen waarin zij weinig autonomie ervaren.

Naast autonomie is ook de feedback die de leidinggevende verstrekt van invloed op motivatie en werkuitkomsten. In Hoofdstuk 3 richten we ons op de invloed van feedbackstijl op motivatie en creativiteit. Twee feedbackstijlen worden onderscheiden: de informatieve en de controlerende feedbackstijl (e.g., Deci & Ryan, 1985a). Informatieve feedback wordt gegeven als ondersteuning bij leer- en ontwikkelingsprocessen, terwijl controlerende feedback bedoeld is om medewerkers te controleren en aan te sporen om te doen wat de leidinggevende wil. We stellen dat mensen met hoge PNS belang hebben bij alle vormen van feedback, omdat zowel controlerende als informatieve feedback duidelijkheid kunnen geven over zaken zoals verwachtingen van de leidinggevende en geldende regels. We verwachtten dan ook dat alleen mensen met een lage PNS meer gemotiveerd zijn en beter presteren wanneer zij informatieve (versus controlerende) feedback krijgen. In een veldstudie hebben we onderzocht of PNS de relatie tussen de perceptie van een elektronisch beoordelingssysteem en intrinsieke werkmotivatie modereert. In lijn met onze verwachting vonden we dat alleen mensen met een lage PNS meer gemotiveerd waren wanneer zij een elektronisch beoordelingssysteem als informatief (versus controlerend) waarnamen. De intrinsieke motivatie van medewerkers met een hoge PNS werd niet beïnvloed door hun perceptie van het beoordelingssysteem. In een experiment hebben we vervolgens onderzocht of PNS ook het effect van het type feedback op creatieve prestatie modereert. Deelnemers werd gevraagd creatieve ideeën te bedenken die naderhand geëvalueerd zouden worden. In de controlerende feedback conditie kregen ze onder andere te horen dat de feedback gebruikt zou worden om te controleren of hun ideeën wel aan de eisen van de onderzoekers zouden voldoen. In de informatieve feedback conditie werd de deelnemers verteld dat ze met behulp van de evaluatie hun creatieve prestaties in de toekomst zouden kunnen verbeteren. Uit de resultaten kwam naar voren dat mensen met een lage PNS creatievere ideeën bedachten wanneer zij informatieve (versus controlerende) feedback verwachtten, terwijl mensen met een hoge

PNS niet beïnvloed werden door het type feedback. Kortom, beide onderzoeken tonen aan dat alleen mensen met een lage PNS profiteren van informatieve ten opzichte van controlerende feedback.

In Hoofdstuk 4 besteden we specifiek aandacht aan een controlerende situatie, namelijk Close Monitoring. CM kan gezien worden als een middel om medewerkers nauwgezet in de gaten te houden. Hoewel CM de mogelijkheden om af te wijken van de geldende regels en voorschriften beperkt, geeft CM ook inzicht in de regels en verwachtingen van de leidinggevende. Vanwege de beperkingen die voortkomen uit CM, verwachtten we dat mensen met een lage PNS minder gemotiveerd en minder tevreden zouden zijn en zich minder innovatief zouden gedragen wanneer ze veel (versus weinig) CM ervoeren. Voor medewerkers met een hoge PNS verwachtten we juist een positieve relatie tussen CM en motivatie en werktevredenheid. CM zou echter niet positief samenhangen met de creativiteit van medewerkers met een hoge PNS, omdat zowel CM als PNS negatieve effecten op creativiteit zouden hebben (e.g., George & Zhou, 2001; Chirumbolo et al., 2004, 2005). In overeenkomst met onze verwachting lieten de resultaten van een veldstudie zien dat medewerkers met een hoge PNS meer gemotiveerd waren wanneer ze het gevoel hadden dat hun leidinggevende hen nauwgezet in de gaten hield. Mensen met een lage PNS waren juist minder tevreden met hun werk wanneer ze meer CM ervoeren. Met betrekking tot creatieve prestaties lieten we zien dat de creatieve prestaties van medewerkers met zowel een lage als een hoge PNS negatief beïnvloed werden door CM. Deze bevinding was niet in overeenkomst met onze verwachting dat vooral medewerkers met een lage PNS minder innovatief zouden presteren wanneer zij veel CM ervaren.

Hoofdstuk 5 gaat in op de relatie tussen PNS en werkwijze of taakaanpak. We verwachtten dat mensen met een hoge PNS geneigd zouden zijn taken stapsgewijs aan te pakken (algoritmisches; e.g., Amabile, 1996), omdat dit zou passen bij hun behoefte om de wereld te versimpelen (Neuberg & Newsom, 1993) en bij hun neiging zich aan



te passen aan de geldende regels en voorschriften (Jugert, Cohrs, & Duckitt, 2009). Mensen met een lage PNS zouden echter geneigd zijn om taken meer flexibel aan te pakken. Deze taakaanpak zou op zijn beurt de relatie tussen PNS en creatieve prestatie kunnen verklaren. In een veldonderzoek hebben we onderzocht of PNS invloed heeft op taakaanpak. We vonden dat mensen met een hoge PNS meer geneigd waren om taken stapsgewijs te benaderen. Vervolgens hebben we in een experiment gekeken naar de causaliteit van deze relatie. Deelnemers werd gevraagd om een buitenaards wezen te tekenen en kregen de mogelijkheid een stappenplan te gebruiken. Zoals verwacht vonden we dat mensen met een hoge PNS meer geneigd waren te kiezen voor het stappenplan, terwijl mensen met een lage PNS liever een tekening maakten zonder het stappenplan. In een vervolgsperiment hebben we mensen gedwongen om wel of geen stappenplan te gebruiken en gekeken naar de creativiteit van het buitenaards wezen. Mensen die het stappenplan gebruikten, bleken een minder creatieve tekening te maken dan mensen die geen stappenplan gebruikten. Kortom, mensen met een hoge PNS zijn meer geneigd om taken stapsgewijs (algoritmisch) te benaderen en dit verklaart een minder creatieve prestatie.

De resultaten van de zeven empirische onderzoeken suggereren dat mensen met een hoge PNS geen profijt hebben van de hoge autonomie, vrijheid en flexibiliteit die HNW met zich meebrengt. Mensen met een hoge PNS raken niet gemotiveerd door autonomie en informatieve feedback (Hoofdstuk 2 en 3). Zij hebben belang bij controlerende leidinggevenden (Hoofdstuk 4) en zijn geneigd zijn om taken stapsgewijs en steeds op dezelfde manier aan te pakken (Hoofdstuk 5).

Praktische implicaties die direct voortvloeien uit de uitkomsten van dit proefschrift lijken te zijn dat medewerkers met een hoge PNS het best tot hun recht komen in banen die hun behoefte aan duidelijkheid en zekerheid vervullen. Zij profiteren niet van autonomie en informatieve feedback, maar lijken eerder gebaat te zijn bij structuur en zekerheid. Daarom zullen mensen met een hoge PNS floreren in

organisaties die goed georganiseerd zijn en duidelijkheid kunnen bieden. Mensen met een lage PNS zullen juist baat hebben bij de vrijheid en flexibiliteit die voortvloeit uit HNW.



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